

MASS.
P.D.
#118

c Document

312066 0285 3204 4

No. 118

FOURTH ANNUAL REPORT

OF THE

COMMISSION ON WATERWAYS AND PUBLIC LANDS

FOR THE YEAR 1919

JOHN N. COLE, *Chairman*

JESSE B. BAXTER

WILLIAM S. McNARY

Commissioners



BOSTON

WRIGHT & POTTER PRINTING CO., STATE PRINTERS

32 DERNE STREET

1920

GOVERNMENT DOCUMENT
COLLECTION
MAY 17 1991
University of Massachusetts
Depository Copy



FOURTH ANNUAL REPORT
OF THE
COMMISSION ON WATERWAYS AND
PUBLIC LANDS

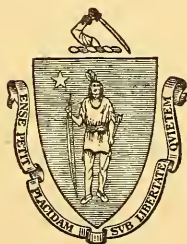
FOR THE YEAR 1919

JOHN N. COLE, *Chairman*

JESSE B. BAXTER

WILLIAM S. McNARY

Commissioners



BOSTON
WRIGHT & POTTER PRINTING CO., STATE PRINTERS
32 DERNE STREET
1920

PUBLICATION OF THIS DOCUMENT
APPROVED BY THE
SUPERVISOR OF ADMINISTRATION.

The Commonwealth of Massachusetts

REPORT.

To the Honorable the Senate and House of Representatives of the Commonwealth of Massachusetts.

The Commission on Waterways and Public Lands respectfully submits the annual report covering its activities for the year ending Nov. 30, 1919. The personnel of the Commission has remained unchanged: John N. Cole, chairman, Jesse B. Baxter and William S. McNary.

RECOMMENDATIONS.

The Commission makes the following recommendations for legislative action:—

FURTHER IMPROVEMENT AND DEVELOPMENT OF THE PORT OF BOSTON.

1. The Commission is of the opinion that the policy of improving the water front of Boston Harbor should be continued in order that adequate facilities may be provided to meet the requirements of the port. It is recommended that the work to be done should include dredging and filling upon the property of the Commonwealth at South Boston and East Boston; the building of railroad connections and bulkheads and the maintenance of Commonwealth Pier No. 1; for further improving and developing the property owned by the Commonwealth at East Boston and under the control of the Commission; also for street and pier development at South Boston; for further improving and developing the property owned by the Commonwealth at and near Hayward's Creek in Quincy and Braintree; for acquiring by purchase or otherwise the location, tracks and trackage rights and privileges of the Union Freight Railroad Company in Boston; and for dredging in and about minor channels in Boston Harbor. Request has been made through the Governor's budget for the estimated expense.

RAIL CONNECTIONS AT EAST BOSTON.

2. The extensive and valuable holdings of the Commonwealth in Boston Harbor, known as the Commonwealth Flats at East Boston, now being reclaimed, need adequate rail connections in order that this territory, a part of which was taken out of private ownership in 1898 and 1913, may be utilized for commercial and industrial purposes for the development of the port. The Acts of 1911, chapter 748, establishing the Directors of the Port of Boston, provided for the taking of property and for the constructing or securing the construction or utilization of piers, and, in connection therewith, highways, waterways, railroad connections, storage yards and sites for warehouses and industrial establishments. In furtherance of the policy outlined in the Acts of 1911, legislation is necessary which shall allow further expenditures for rail connections.

ACQUISITION OF THE LOCATION, TRACKS AND TRACKAGE RIGHTS
AND PRIVILEGES OF THE BOSTON, REVERE BEACH & LYNN
RAILROAD COMPANY.

3. A matter involved in the far-reaching possibilities of development and future use of the Commonwealth's lands and flats in East Boston is rail connections between the State's property and an existing railroad. In making such connections the Commission believes that the Boston, Revere Beach & Lynn Railroad Company offers advantages for furnishing such service in connection with an improvement of its facilities for passenger service, and the Commission therefore recommends that the Legislature authorize the acquisition, by purchase or otherwise, of the location, tracks and trackage rights and privileges of the Boston, Revere Beach & Lynn Railroad Company, or any part thereof, and the building of such rail connections with the tracks of said company as may be deemed necessary and advisable for the further development and utilization of this property.

GRAIN ELEVATOR.

4. The Commonwealth should provide on its lands at South Boston, for the development of the port of Boston, a grain elevator of the most modern type, taking into consideration

what other large ports are doing in providing facilities of this character. It is recommended that legislation be enacted which will provide the necessary authority and the requisite amount of money.

MALDEN RIVER.

5. The river and harbor act of Congress, approved March 4, 1915, relative to the improvement of Malden River, in which the cities of Malden, Medford and Everett are particularly interested, contains the following provision: "that any increase in cost involved in the execution of said modified plan shall be paid by local interests and involve no further appropriation by the United States for the prosecution or completion of said improvement."

The Commission, realizing the importance of this project of the Federal government, agreed during the year that it would allot the amount of \$35,000 from funds at its disposal, provided an equal amount would be provided by the three municipalities, and thus insure the accomplishment of this improvement. Subsequently, chapter 237 of the Special Acts of 1919 was passed, authorizing the cities of Malden, Medford and Everett to incur indebtedness in connection with the development of the port of Boston not exceeding \$12,000 each outside the debt limit. As the actual dredging is to be done under the direction of the Federal government and not by the State, and the requirement is that the State's contribution and that of the three cities, amounting in the aggregate to \$70,000, must be paid to the Secretary of War before operations are commenced, legislation which will allow the placing of the State's contribution and that of the three cities to the credit of the Secretary of War becomes necessary.

HARBOR LINE ON WEYMOUTH FORE RIVER.

6. In order to build structures and do other work on Weymouth Fore River above Quincy Point bridge for the improvement and development of property belonging to the Commonwealth, and under the jurisdiction and control of the Department of Public Works, and property of private parties, it is necessary to change and extend that part of the present harbor line above Quincy Point bridge established by chapter

280 of the General Acts of 1916. It is recommended that the present harbor line be changed and extended in accordance with a bill to be submitted.

CONSERVATION OF WATER RESOURCES.

7. The Commission on Waterways and Public Lands, and its predecessor in authority, has in past years made extended investigations relative to the conservation, development and utilization of the water resources within the Commonwealth of Massachusetts. This subject has also been investigated and reported upon by a special commission in 1919. The importance which attaches to this matter leads the Commission to recommend legislation.

PROVINCE LANDS.

8. The Province Lands in Provincetown, comprising about 3,290 acres, were placed under the general care and supervision of the former Board of Harbor and Land Commissioners by chapter 470 of the Acts of 1893. The Commission, as successor to that Board, has practically expended the balance of the appropriation of \$15,000 made by chapter 254 of the Special Acts of 1916, which was to be expended within four years. A large part of these lands have been reclaimed by planting beach grass and by other work, the object being to prevent the waste and barren conditions brought about by wind and storm by covering the sand dunes and other exposed localities. For the purpose of continuing this work, and for carrying out other work incidental to the protection and improvement of this property, further appropriation is necessary.

EXTENSION OF JURISDICTION.

9. It is recommended that the Department of Public Works be given the same powers and duties with respect to lands and structures, under the jurisdiction and control of said department in other parts of the Commonwealth, that said department now has with respect to the Commonwealth's lands and structures at or near South Boston, under the provisions of chapter 96 of the Revised Laws, and acts in amendment thereof and in addition thereto.

BOSTON HARBOR.

THE COMMONWEALTH FLATS AT SOUTH BOSTON.

Commonwealth Pier No. 5.

On Feb. 10, 1919, under the terms of an agreement dated March 17, 1918, the use of this pier by the United States Navy was terminated. An agreement under date of Feb. 1, 1919, was, however, made with the Quartermaster's Department, United States Army, for the use of the entire pier until June 30, 1919. Upon this date occupation by the Federal government ended and the pier was freed for commercial use.

On Sept. 3, 1919, a contract was made with the Metropolitan Coal Company to furnish 1,000 tons of semi-bituminous coal for the heating plant at \$9.25 per ton.

Dry Dock.

The work of constructing the dry dock at the Commonwealth flats at South Boston has been practically completed during the year. Under the general contract with Holbrook, Cabot & Rollins Corporation, approved by the Governor and Council Oct. 13, 1915, the work of constructing the dock itself was substantially finished on June 11, 1919, on which date the flooding of the dock was begun. The caisson was floated into position on June 13, 1919, and the dock pumped out a week later. The dock and its equipment were in condition for receiving and handling a vessel on Dec. 22, 1919, when the United States battleship "Virginia" was successfully docked. A few small details were incomplete, but all work on the dock was actually finished Jan. 21, 1920.

The work of erecting the pumping plant under the contract with the Worthington Pump and Machinery Corporation, dated July 30, 1917, was completed, so that the pumps were used for unwatering the dock in June, 1919, and tests were made during August and September. The pumps developed a capacity and efficiency in excess of that required by the specifications, and were found to be satisfactory in every respect.

The contract dated Jan. 23, 1918, with the Donnelly Iron Works, Incorporated, for furnishing the steel and concrete floors and stairways in the pump well was completed on Dec. 28, 1918. The contract dated June 19, 1918, with the Weiss Construction Company for erecting a building on the foundation was finished on April 14, 1919.

The contract dated July 1, 1918, with the Whiting Foundry Equipment Company for furnishing and erecting a hand-operated overhead crane in the pump house to handle the heavy parts of the pumping machinery was completed on March 6, 1919. Since that time the crane has been used in handling and installing the heavy parts of the pumping plant, except the main pumps themselves, which were fitted in place before the crane was erected.

The contract dated April 23, 1918, with the Bethlehem Steel Bridge Corporation for furnishing and erecting within the dock the caisson to be used to close the entrance to the dock was completed Aug. 29, 1919. The caisson was substantially completed and placed in the groove at the entrance to the dock on June 13, 1919, where it has been found to work in a thoroughly satisfactory manner.

The sluice gates furnished and erected under contract with the Coffin Valve Company, dated Aug. 21, 1917, were finally completed on Oct. 31, 1919, and are now working well, although many minor changes had to be made in the gates by the contractor in order to put them into proper condition. The gates are operated by hydraulic cylinders by power furnished by part of the machinery installed under the contract with the Worthington Pump and Machinery Corporation.

The transformers and their equipment were furnished under a contract with the General Electric Company dated June 26, 1917, and were finally erected July 15, 1919, although the contractor found some changes in the casings necessary.

The power capstans for handling vessels in and out of the dock were furnished under contract with the Wellman-Seaver-Morgan Company of Cleveland, Ohio, dated Nov. 1, 1918. This contract was completed on Oct. 8, 1919. The capstans were tested at the time the battleship "Virginia" docked, on Dec. 22, 1919, and were found to work excellently.

In addition to the power capstans, six hand capstans have been furnished for use in connection with the power capstans in handling vessels in and out of the dock. These were provided under contract with the Dake Engine Company, dated April 14, 1919. They were installed by the general contractor, and were all in place before the battleship was docked.

On March 6, 1919, a contract was made with Irving L. Matson to furnish and install the necessary cables and apparatus for distributing electric current from the pump house to the capstans and caisson. This contract was completed Oct. 4, 1919.

The general contract provided for dredging the approaches to the dry dock from the main ship channel to a depth of 37 feet at mean low water. The contract provided that care should be taken to see that sufficient material was left to complete the filling. For this reason, in 1916, the contractor stopped work on the dredging of the approach channel, taking material to other places, but leaving at that time enough material, as estimated, to do the back filling around the dock upon its completion. Owing to changes which were made in the plans, due to the character of the rock excavation and to the sale of a large part of the surrounding territory for the army supply base, it was found that there would be a surplus of about 330,000 cubic yards to be taken away. After the contractor stopped the excavation and disposal of material taken from the approach channel he was directed to leave this material, because of the increase in price. On Aug. 20, 1919, a contract was made with the Boston Dredging Company to do as much of this work as was necessary to make a proper approach channel to the dry dock for the sum of 65 cents per cubic yard. Under this contract about 210,000 cubic yards of material have been excavated, to make a channel giving a satisfactory approach. This contract is not fully completed, as a few shoals remain to be removed as soon as the weather is suitable in the spring.

The cost of the work done under the various contracts is as follows: —

CONTRACT.	Contractor.	Amount paid.
Borings,	Giles & Clark,	\$2,442 90
Sluice gates,	Coffin Valve Company,	21,500 00
Pumps,	Worthington Pump and Machinery Corporation.	193,119 00
Bonus,	Worthington Pump and Machinery Corporation.	4,457 00
Caisson gasket,	United States Navy Department, . . .	4,963 62
Floors and stairs,	Donnelly Iron Works, Inc.,	24,480 71
Electric transmission system, . .	Irving L. Matson,	10,355 13
Hand capstans,	Dake Engine Company,	1,545 00
Crane,	Whiting Foundry Equipment Company, .	4,150 00
Electric capstans,	Wellman-Seaver-Morgan Company, . . .	73,865 00
Transformers, — furnishing, erection.	General Electric Company,	15,252 00
		1,285 00
Pump house,	Weiss Construction Company,	34,664 00
Caisson,	Bethlehem Steel Bridge Corporation, . .	393,692 50
General contract,	Holbrook, Cabot & Rollins Corporation, .	1,979,055 94
Dredging approaches,	Boston Dredging Company,	136,528 60
Crossing frogs,	Barbour-Stockwell Company,	1,100 00
Engineering and incidentals, . . .	- - -	264,944 75
		\$3,167,401 15

Under date of July 22, 1919, the Commonwealth of Massachusetts, represented by the Commission on Waterways and Public Lands, made a contract with the United States of America, represented by the Secretary of the Navy, for the sale to the United States of the dry dock at South Boston, with an additional parcel of land adjacent thereto, the whole containing 4,396,480 square feet, for the sum of \$4,158,385.58.

Dry Dock Avenue.

Under the agreement for the sale of the dry dock to the Navy Department the Commonwealth agreed to pave and regulate Harbor Street 75 feet wide from Summer Street to Dry Dock Avenue, and Dry Dock Avenue 80 feet wide from Harbor Street to the water front, a distance of about 2,800 feet. On May 12, 1919, a contract was made with Coleman Brothers, to pave and regulate the above streets, and this work was commenced at once and substantially completed at the

date of this report. The roadway was paved with 5-inch granite blocks with a granite curb on each side. A sidewalk was built on the northerly side of Dry Dock Avenue only, and paved with second-hand vitrified paving blocks which had been removed from the Fish Pier the previous year. Owing to the fact that a small building covering the air compressor used in constructing the dry dock occupied about 300 square feet of the sidewalk, and was not removed until after the work of paving Dry Dock Avenue was completed, the contractor was instructed to leave the necessary curbstone and paving material in order that this small area could be paved as soon as the building was removed. This small amount of paving will be completed when the frost is out of the ground in the spring. The cost of work under this contract to Nov. 30, 1919, was \$128,774.82.

Commonwealth Pier No. 6 (Fish Pier).

The work of repaving a portion of the Fish Pier under contract with Coleman Brothers, in progress at the date of the report for 1918, has been completed at a total cost of \$57,163.10. Under this contract the brick pavement on both sides of the pier, extending the whole length of the two main buildings, was relaid with 4-inch granite blocks, grouted. The concrete base which had settled badly was brought up to grade, and in many places where the concrete had rotted by the action of the salt, which had worked down through the brick work, the injured material was removed and a new base substituted. The paving around the two tracks on the pier was relaid on a concrete base, and the tracks were brought up to grade by the Boston Fish Market Corporation. A portion of the central street from the rear of the building over the street back to the line of the two main buildings was also relaid on a concrete base, together with the space between the cold-storage building and the two main buildings. In addition to the above, a number of small places which had settled badly were taken up and relaid on a gravel base. In connection with this, and as a part of the contract, the paving on both sides of the street railway track on the ramp was relaid on a gravel base.

Railroad Yard at South Boston.

In 1914 the Commonwealth laid on its premises at South Boston about 6 miles of railroad track to connect the Commonwealth Pier and other properties on the Commonwealth flats with the New York, New Haven and Hartford Railroad, and to furnish storage facilities for railroad cars. Later the Railroad Company was authorized to use the surplus capacity of the yard for the sum of \$14,000 per year and the maintenance of the portion of the tracks used. About one-third of the tracks were not included in this agreement, and as it was found that they needed considerable repairs to keep them in proper condition for operating, a track gang, consisting of a foreman and three men, has been employed to keep them in repair.

In connection with the construction of temporary storehouses by the United States south of Summer Street, the United States built the necessary railroad tracks to connect these storehouses with the New Haven yard, and also a track extending from Cypher Street northerly and near C Street, connecting the same with the tracks which had previously been built by the Commonwealth to furnish railroad connections with property which it had recently sold. In order that the tracks might be wholly under the control of the Commonwealth, a track extending from C Street to Fargo Street, built by private parties under permit from the Directors of the Port of Boston in 1914, was purchased by the Commonwealth. Since the purchase of these tracks other land has been sold, and in order to furnish proper facilities to all these properties, the Commonwealth has purchased about 80 tons of steel rails, the necessary ties and other track materials, and proposes early in the spring to reconstruct its tracks with such additional tracks as may be necessary to furnish facilities to all the land sold.

Reserved Channel Bulkhead.

The work of constructing the bulkhead on the southerly side of the Reserved Channel from City Point to Governors Island under contract with William L. Miller Company, which was nearing completion at the date of the report for 1918, was fin-

ished on Dec. 23, 1918, at a total cost of \$167,325.86. A large part of the area enclosed by this bulkhead was filled with material dredged from the Reserved Channel in connection with the construction of the Boston army supply base by the United States government, and the filling is now being completed with material dredged from Pleasure Bay, near the Marine Park at South Boston.

Dredging Reserved Channel and Pleasure Bay.

Before the sale of land for the Boston army supply base to the United States, the Reserved Channel had been dredged by the Commonwealth to the depth of 30 feet at mean low water from the main channel of the harbor to L Street bridge, and above the bridge to the depth of 12 feet at mean low water for a full width of 400 feet. When the sale was made to the United States, the width of the channel was made 500 feet. In constructing its wharf the Federal government set the wharf line back 100 feet from the channel line, and then dredged that portion of the channel which had not been dredged by the Commonwealth to the depth of 30 feet at mean low water, and the berth alongside its wharf 35 feet deep at mean low water, and also dredged from the outer end of its wharf to the main ship channel to the depth of 30 feet at mean low water, including the berth on the northerly side of the wharf. The dredging by the government connects with the dredging done by the Commonwealth in front of the dry dock, making the whole territory not less than 30 feet deep at mean low water.

The material excavated by the government in connection with this work was nearly all used for filling on the land between City Point and Governors Island which had been enclosed by the bulkhead built by the Commonwealth. As less than one-half the area was filled with this material, Pleasure Bay, by an arrangement with the city authorities, is being dredged. The work is now in progress, 1,259,796 cubic yards having been excavated and placed in the fill during the year. It is expected that this filling will be completed during the coming year, and will give the Commonwealth an area of over 50 acres for development. The area borders on the Reserved Channel

for about 2,500 feet with a depth of 30 feet at mean low water, and can be connected with the railroad by extending the present industrial track in East First Street about 1,000 feet in to the territory.

Trolley Freight Shed.

A wooden freight shed located at the foot of the ramp from the viaduct on the Commonwealth flats at South Boston was built in the winter of 1917 and 1918 for the use of the trolley freight business, and later used by the Baldwin Shipping Company, Incorporated, for loading railroad freight cars.

In order to prepare it for this change in business it was necessary to remove a portion of the trolley freight wires over the track on the southerly side of the building, and this was done by the employees of the Commonwealth. Some small repairs had to be made to the building after its use as the trolley freight shed, and this was all done at an expense of approximately \$50.

The street railway track on the viaduct and ramp has not been in use during the year.

Viaduct.

The Viaduct, built by the Commonwealth in 1914, extends from Summer Street to Commonwealth Pier No. 5, with a ramp to the Fish Pier. Early in the year the steel work on the viaduct was found to require painting. On July 30, 1919, a contract was made with Maurice M. Devine, the lowest bidder, to clean and paint the steel work for the sum of \$3,985. This work was completed Nov. 29, 1919.

In connection with this work the contractor was employed to paint the steam pipes and their supports leading from the heating plant to Commonwealth Pier, and to paint some of the railings on the ramp and viaduct. This was completed at the same time for the sum of \$536.

THE COMMONWEALTH FLATS AT EAST BOSTON.

A comparatively small amount of work has been done at East Boston, as the rehandling dredge has been engaged for the greater part of the season at South Boston. On June 15, 1919, when the basin had been filled to such an extent that no more

material could be placed there, the dredge was sent from South Boston to clean out the dumping basin and deposit about 437,703 cubic yards of material on the flats back of the existing bulkhead. Since that time material seeking a dumping ground has been placed in this basin. Early in the year it will be necessary to re-excavate this basin by means of the dredge working in the meantime at South Boston.

In order to continue the work at East Boston, a contract was made with William S. Rendle, to construct about 1,600 feet of bulkhead in extension of the existing bulkhead along the bulkhead line. This work is nearing completion at the present time. The strengthening of the bulkhead by placing dredged material between the bulkhead proper and the anchorage basin will need to be done as soon as the weather is suitable in the spring, after which the general filling will be dumped into the basin partially enclosed by the bulkhead. A large amount of material — 368,665 cubic yards, containing some broken stone, brought from the government dredging at Weymouth Fore River — has been dumped on the area northerly of Governors Island, where it will not need to be rehandled.

Surveys and estimates have been made for the construction of railroad tracks to connect the Commonwealth flats with the Boston & Maine and Boston & Albany Railroad tracks near Chelsea Creek.

COMMONWEALTH PIER No. 1 AT EAST BOSTON.

The work of building Commonwealth Pier No. 1 at East Boston, in progress at the date of the report for 1918, under contract with William L. Miller Company, was accepted as satisfactorily completed on March 6, 1919, at a total cost of \$306,620.60.

The contract with J. Caddigan Company for furnishing and installing plumbing and heating on the pier was satisfactorily completed on Feb. 24, 1919, at the contract price of \$5,047.

A contract made on April 10, 1919, with the Lord Electric Company, the lowest bidder, to furnish and install the electric light and power systems on the pier was completed on June 6, 1919, at a cost of \$4,243.21. This work comprised the lighting of the whole pier, including the offices, and the construction of

a power wiring system with eight outlets for attaching electric winches.

On June 30, 1919, a contract was made with the Lenher Engineering Company for furnishing at the pier two electric winches for discharging vessels. These were delivered, tested and found satisfactory early in November. The cost of work under this contract was \$3,690.

For fire protection on the pier a contract was made with the Globe Automatic Sprinkler Company for installing a fire protection and sprinkler system to cover the whole pier and the various offices. This work was completed on Sept. 9, 1919, at a total expense of \$11,391.

Minor repairs have been made at the pier during the year and an office added to accommodate the United States Custom House inspectors.

DREDGING OPPOSITE PROPERTY OF THE SIMPSON'S PATENT DRY DOCK COMPANY.

The work, in progress at the date of the report for 1918, of dredging shoaling opposite property of the Simpson's Patent Dry Dock Company at East Boston, caused by the work of the Commonwealth at Jeffries Point, was completed Jan. 7, 1919, at an expense of \$2,356.65.

ANCHORAGE BASIN.

No work has been done in this basin except to replace some of the dolphins marking the northerly boundary after their destruction by vessels. The cost of repairs to these dolphins during the year amounts to \$243.57.

CHELSEA CREEK.

The contract with the Atlantic, Gulf & Pacific Company, assigned to the Bay State Dredging and Contracting Company, for dredging the channel in Chelsea Creek above the Grand Junction railroad bridge was completed on Aug. 11, 1919. In all, 138,202 cubic yards of material were excavated and deposited at the dumping basin at Jeffries Point by the Bay State Dredging and Contracting Company at a cost of \$35,241.51.

HOUGHS NECK.

Dredging. — In June a survey was made of the channel leading from the channel of Weymouth Fore River to the public landing place near the landing of the Quincy Yacht Club at Houghs Neck. It was found that the anchorage basins near the public landing and the yacht club landing had shoaled, and that the channel itself had shoaled slightly.

A contract was made on July 30, 1919, with the Bay State Dredging and Contracting Company, the lowest bidder, to dredge the channel and anchorage basins at this place at a contract price of 57 cents per cubic yard, the material to be deposited at the rehandling basin at East Boston. This work was completed on Sept. 8, 1919. Material to the amount of 23,222 cubic yards was excavated under this contract and deposited at East Boston, at a total cost of \$13,236.54.

Toward the cost of this work a contribution of \$1,000 has been made by the Quincy Yacht Club.

Amount expended during the year, \$13,979.87.

Total expenditure to Dec. 1, 1919, \$28,452.54.

Sea Wall. — The work of constructing the sea wall at Houghs Neck, under contract of Sept. 18, 1917, with Dennis F. Crowley, was continued during the summer. The wall itself was completed early in the fall, but only a small portion of the riprap in front of it has been placed.

The city of Quincy has begun the filling back of the wall which it agreed to do when the Commonwealth undertook the construction of the sea wall.

Amount expended during the year, \$393.55.

Total expenditure to Dec. 1, 1919, \$7,322.27.

ORIENT HEIGHTS DREDGING.

On Oct. 3, 1919, a contract was made with the Gerrish Dredging Company, the lowest bidder, to excavate a channel and basin at the inner end of the existing channel leading from the harbor channel to the Orient Heights Yacht Club location at a contract price of 33 cents per cubic yard. The basin near the yacht club is to be enlarged and a channel dredged from the basin to the landings of the East Boston Yacht Club, the

Breakers' Yacht Club and the Harbor View Yacht Club. In addition, a small shoal near the entrance of the channel is to be removed.

The work under this contract progressed until it was stopped by ice in the harbor, after about one-third of the work had been done. A large amount of the excavated material was deposited on the flats inside the half-tide dam extending from Orient Heights to East Boston. Across this area is the natural outlet of the water from the basin lying between Orient Heights and East Boston. The portion under Bennington and Saratoga streets and the Boston, Revere Beach & Lynn Railroad is a masonry culvert. The railroad and street embankments form a dam which enclosed the water on the easterly side of the basin, and the old embankment of the Eastern Railroad encloses the basin on the west, the only outlet being through the culvert under the two streets and the Boston, Revere Beach & Lynn Railroad.

For some time past the water in the basin has been kept below high-water mark by stop planks at the inner end of the culvert, and the water drawn down from time to time as it accumulated, in order to prevent overflow of the premises of the Maverick Mills.

In doing the filling under the Gerrish contract, the outlet of this culvert was closed to such an extent that the water in the basin west of the streets could not be drawn down, and there was some probability that in case of heavy rain or thaw the basement and storehouse of the Maverick Mills might be flooded. When the work of dredging stopped, the barriers were removed so that the water drains freely from the basin, but provision should be made in the immediate future for extending the culvert across the land which is being filled.

Amount expended during the year, \$12,427.87.

Total expenditure to Dec. 1, 1919, \$23,371.14.

WEIR RIVER DREDGING.

During July a survey was made of the channel to Weir River in the town of Hull, from the wharf of the Nantasket Beach Steamboat Company to a point opposite World's End near the mouth of the river, with a view to straightening and deepening

the channel to give sufficient room for general navigation, in addition to the traffic of the Nantasket Beach Steamboat Company.

On Sept. 15, 1919, a contract was made with the Bay State Dredging and Contracting Company to dredge the channel 12 feet deep at mean low water and 275 feet wide, extending from a point about 100 feet southwesterly of the Steamboat Company's wharf to a point opposite World's End near the mouth of the river, the excavated material to be deposited at the rehandling station at East Boston.

The contract price for this work is 53 cents per cubic yard, measured in scows. Up to Dec. 1, 1919, 75,132 cubic yards had been excavated, completing the lower half of the channel.

Amount expended during the year, \$35,663.13.

Total expenditure to Dec. 1, 1919, \$35,663.13.

HAYWARDS CREEK.

In order to develop the property at Haywards Creek, and furnish railroad facilities to the land which the Commonwealth sold there, a contract was made with the Old Colony Contracting Company, Inc., for the building of about 1,875 feet of track extending from the track of the Fore River Railroad Corporation near Quincy Avenue, in the city of Quincy, across Haywards Creek to give connection to the wharf which the Commonwealth is to build at Haywards Creek, and to the property which has been sold to the Massachusetts Oil Refining Co., Inc. While this work was under way arrangements were made to have the Fore River Railroad Corporation take over the portion of track so built in order to avoid the necessity of its being operated by the Commonwealth, and the cost of work under the contract was paid by the Railroad Corporation.

Various plans and surveys have been made in connection with the development and sale of this property. Plans have been approved for the construction by the Bethlehem Shipbuilding Corporation, Ltd., of a culvert through Haywards Creek, and the filling of said creek in order to more fully develop the property of the Commonwealth. Plans have been made for the construction of a pier for the accommodation of vessels, and the Bethlehem Corporation is at work developing

the portion of the State property which it recently purchased, as well as that which it holds under lease from the Commonwealth. The Massachusetts Oil Refining Co., Inc. has also during the year been actively at work in constructing buildings and machinery for the development of the property which it purchased from the Commonwealth and others.

RIVERS, HARBORS, TIDEWATERS AND FORESHORES,
EXCLUSIVE OF BOSTON HARBOR.

By chapter 481 of the Acts of the year 1909 the Board of Harbor and Land Commissioners was authorized and directed to undertake such work for the improvement, development, maintenance and protection of rivers, harbors, tidewaters and foreshores within the Commonwealth as it may deem to be reasonable and proper, and to expend during the years 1910, 1911 and 1912 a sum not exceeding \$300,000, not more than \$100,000 to be expended in any one year; provided, however, that an unexpended balance in any year may be used in the succeeding year.

This act also provided that the Board shall consider the general public advantage of the proposed work, the local interest therein as manifested by municipal or other contributions therefor, the importance of the industrial or commercial and other interests to be especially served thereby, and any other material considerations affecting the feasibility, necessity or advantage of the proposed work or the expenditure therefor. It was further provided that no work shall be commenced until after a public hearing has been held and a survey and estimate of cost have been made; that a city or town might appropriate money for the improvement of rivers, harbors, tidewaters and foreshores within its jurisdiction, the money so appropriated to be paid into the State treasury, to be expended by the Board for said purposes; and that the city or town might assume liability for all damages to property suffered by any person by any taking of land, or of any right, interest or easement in land within the city or town made by the Board for the purposes authorized by the act. By chapter 642 of the Acts of 1912 the expenditure of a sum not exceeding \$450,000 during the years 1913, 1914 and 1915 was authorized, and by chapter 231 of the General Acts of 1919, the additional expenditure during the years 1919, 1920 and 1921 of a sum not exceeding \$750,000, making a total appropriation for the period 1910–21, inclusive, of \$2,250,000 for the purposes set forth in the act of 1909.

Petitions under the act of 1909 aforesaid have been filed with the Commission during the year for surveys and improvements in the following localities: Bucks Creek, Chatham; Connecticut River, South Hadley; Gloucester Harbor; Lynn Harbor, Lynn; Manchester Harbor, Manchester; Mitchells River, Chatham; Nobscusset Point, Dennis; Oak Bluffs; Pocasset Harbor, Bourne; Popponesset Bay, Barnstable and Mashpee; Saugus River, Revere; Scituate sea walls; Sesuit Harbor, Dennis; West Bay, Barnstable; West Dennis shore.

Other than the holding of public hearings, and in some cases the making of surveys and estimates of cost, no conclusive action as to allotments has been taken during the year for carrying into effect improvements in these localities except at Bucks Creek, Chatham; Gloucester Harbor; Lynn Harbor and Saugus River; Manchester Harbor; Nobscusset Point, Dennis; Popponesset Bay, Barnstable and Mashpee; and Sesuit Harbor.

For information relating to the work accomplished in the various harbors and rivers throughout the Commonwealth, not specifically described in this report, attention is invited to the annual reports of the former Board of Harbor and Land Commissioners, and to the annual reports of the Commission on Waterways and Public Lands for the years 1916, 1917 and 1918; also to the tables in the Appendix, which show localities, character of work, appropriations, contributions and expenditures by the Commonwealth, and certain appropriations and expenditures by the Federal government.

BASS RIVER, DENNIS AND YARMOUTH.

In June, 1919, the attention of the Commission was called to the condition of a basin filled with offensive seaweed near the inshore end of the westerly jetty. On Aug. 4, 1919, a contract was made with John R. Burke for filling the basin with material dredged from a sandbar on the westerly side of the channel.

The contract price for this work was: for use of the dredge "Neponset," fully equipped and manned, including all additional plant necessary to maintain the dredge in operation to excavate material and fill a basin, the sum of \$350 for each calendar day, exclusive of Sundays and holidays, required to

perform the work, subject to deductions for loss of time as provided in the contract.

Work under this contract was completed Aug. 18, 1919, at a cost of \$2,100.

Amount expended during the year, \$2,106.41.

Total expenditure to Dec. 1, 1919, \$74,017.75.

BUCKS CREEK, CHATHAM.

On March 26, 1919, hearing was held on a petition of the selectmen of Chatham, and others, under chapter 481 of the Acts of 1909, for the extension of the present jetty and for dredging. On May 21, 1919, a contract was made with John R. Burke for dredging a channel and building a pile and timber jetty on the easterly side of the entrance to this creek.

The contract prices for this work were: for dredging channel and disposing of the dredged material, including bowlders 1 cubic yard or less in volume, the sum of 97 cents for each cubic yard of material excavated and measured *in situ*; for furnishing materials and building pile and timber jetty, and all incidental work, the sum of \$20 per linear foot of pile and timber jetty in place.

Work was completed Aug. 9, 1919, and consisted of building a pile and timber jetty on the easterly side of the entrance to the creek extending from the end of the stone jetty parallel to the timber jetty on the westerly side, a distance of 450 feet, carrying it through a sandbar which had formed across the entrance a short distance beyond the westerly jetty. A channel was dredged between the jetties to an average depth of 4 feet at mean low water, and a width of 30 feet from the 4-foot contour outside the jetties to the natural channel of the creek opposite the inshore end of the easterly jetty, a distance of 850 feet.

The cost of this work was \$15,790, toward which the town of Chatham made a contribution of \$500.

Amount expended during the year, \$16,300.71.

Total expenditure to Dec. 1, 1919, \$31,067.74.

CONNECTICUT RIVER.

Hadley.

Work under contract of July 17, 1918, with Daniel O'Connell's Sons was completed Dec. 21, 1918, and consisted of the building of a low dam of heavy riprap from the easterly bank of the river in a southwesterly direction about 195 feet toward the head of an island opposite Shepard's Island, and riprapping the bank above the inshore end of the wall for a distance of about 700 feet. The cost of this work was \$10,426.91.

Amount expended during the year, \$4,335.22.

Total expenditure to Dec. 1, 1919, \$97,740.94.

South Hadley.

During the year a petition under the provisions of chapter 481 of the Acts of 1909 was filed for an extension of the concrete diversion wall built by the Commonwealth near the easterly bank of the Connecticut River in South Hadley Falls. The Engineer of the Commission reported that the wall previously built appears to have accomplished its object, and that the extension requested would produce an undesirable contraction of the cross section of the river above the highway bridge.

Total expenditure to Dec. 1, 1919, \$7,379.58.

West Springfield.

In September, 1919, the attention of the Commission was called to the necessity for protecting from further erosion the bank of the Connecticut River adjoining Riverside Street. On Oct. 1, 1919, a contract was made with Daniel O'Connell's Sons for furnishing and placing in position stone riprap in two places on the westerly bank of the river. The contract prices for this work are: for furnishing and placing riprap, sloping bank, extending drains, sewers or pipes, and removing fallen trees, drift, stumps and bushes, and all incidental work, the sum of \$3.05 per ton of stone in place on the bank of the river; for replacing the stone and broken concrete on the bank, sloping bank, extending drains, sewers or pipes, and removing fallen trees, drift, stumps and bushes, and all incidental work, the

sum of \$1.45 per ton of stone or concrete in place on the bank of the river.

Work under this contract was completed Nov. 21, 1919, and consisted of placing stone riprap on the slope of the bank to a height of 10 feet above low water, extending upstream from the outlet of the sewer in Southworth Street a distance of about 600 feet, and beginning again at a point 400 feet above and extending upstream a distance of about 200 feet. The work included the placing in position of about 790 tons of stone and broken concrete previously deposited in several places on the bank.

Amount expended during the year, \$2,796.99.

Total expenditure to Dec. 1, 1919, \$7,848.48.

ELLISVILLE HARBOR, PLYMOUTH.

Work under contract of Aug. 21, 1917, with Dennis F. Crowley for excavating a channel and basin and riprapping the banks of the channel was completed Nov. 30, 1918.

On May 19, 1919, a contract was made with the Boston Dredging Company for dredging a shoal in the channel of this harbor to low water, and placing the excavated material in the dike crossing the old channel. This work was to be done in connection with certain work at Sandwich Harbor.

The contract price was: for use of dredge "Kennebec," fully equipped and manned, to excavate a shoal in the channel in Ellisville Harbor, Plymouth, and place the material in the dike across the old channel, as directed by the engineer, the sum of \$550 for each calendar day, exclusive of Sundays and holidays, from the time the dredge leaves the Sandwich end of the Cape Cod Canal to her return to the Canal, subject to reductions for loss of time as provided in the contract.

Work under this contract was completed June 1, 1919, and consisted of the redredging of the channel to mean low water for a distance of 300 feet, and the depositing of the material on the bank.

Amount expended during the year, \$3,050.20.

Total expenditure to Dec. 1, 1919, \$11,256.82.

FALL RIVER HARBOR.

State Pier.

Reference is made to the report of the Commission for the year ending Nov. 30, 1916, setting forth the provisions of chapter 279 of the General Acts of 1915 authorizing the construction of a public pier and other necessary structures and connections on the water front of Fall River; the various sketch plans, studies and estimates of cost; the votes passed by the former Board of Harbor and Land Commissioners; the license granted to the Old Colony Railroad Company to do certain filling in Fall River Harbor adjoining its Globe freight yard, enabling it to make the necessary railway connections with the proposed pier; and conferences held with the mayor and other officials of Fall River.

During the year conferences have been held with various officials of the city and with members of the Fall River Chamber of Commerce. Reports of the engineer of the Commission with reference to the proposed site for the pier have been presented and considered. The city has not as yet purchased the necessary site for the pier.

FALMOUTH HEIGHTS SEA WALLS.

The work of building a concrete sea wall and spur jetties at Falmouth Heights under contract of June 12, 1918, with William H. Connor was completed Dec. 10, 1918, and consisted of the building of 876.53 feet of wall, with spur jetties, at the foot of the bluff west of the clubhouse, and 1,372 feet of wall, with spur jetties, on the crest of the beach east of the clubhouse; and the repairing of foundations of a portion of the sea wall built by the town at the foot of the bluff.

On Dec. 11, 1918, a contract was made with John A. Davis for building timber jetties in front of the concrete sea wall built by the town at Falmouth Heights and the repair of certain portions of said wall. The contract price for this work was: for furnishing all materials and building timber jetties, including excavating for plank sides, filling between same, and all incidental work, the sum of \$63.44 for each jetty complete in place.

Work under this contract was completed Jan. 16, 1919, and consisted of the construction of 25 pile and plank jetties, 15 feet long and 20 feet apart on centers, in front of the wall built by the town; and the repairing of the wall in two places. Toward the cost of this work the town of Falmouth contributed \$2,000. Under an arrangement with William H. Connor certain filling was placed back of this wall.

In the spring of 1919 additional work appeared to be necessary at the wall built by the Commonwealth. Under an arrangement with John A. Davis a spur jetty was built at the easterly end of this wall, and certain refilling done at the spur jetties built by the Commonwealth in front of the sea wall built by the town.

In October it became necessary to place about 1,000 cubic yards of material as filling back of the retaining wall. This work is now in progress under an arrangement with Nathan S. Ellis.

Amount expended during the year, \$17,019.51.

Total expenditure to Dec. 1, 1919, \$48,139.52.

FALMOUTH INNER HARBOR (FORMERLY DEACONS POND HARBOR).

In the latter part of the year sand was being washed into the channel through several large openings in the stone work of the west jetty at the entrance to this harbor. Under an arrangement with John A. Davis repairs were made at this jetty.

Total expenditure at this harbor to Dec. 1, 1919, \$71,480.57.

GLOUCESTER HARBOR.

On March 26, 1919, hearing was held on a petition of the Gloucester Board of Trade and others, under chapter 481 of the Acts of 1909, for dredging and removal of ledge near Five Pound Island.

A contract was made on July 28, 1919, with the Boston Dredging Company to dredge a channel westerly, northerly and northeasterly from Five Pound Island to a depth of 16 feet at mean low water, and to build a pile dolphin opposite a turn in the channel. The contract prices for this work were: for dredging the channel and disposing of the dredged ma-

terial, including bowlders 1 cubic yard or less in volume, the sum of 67 cents for each cubic yard of material excavated and measured in the scows in which it is placed for transportation to the dumping ground; for excavating bowlders in excess of 1 cubic yard and not greater than 5 cubic yards in volume, and disposing of the same, the sum of \$20 for each cubic yard; for excavating ledge and bowlders in excess of 5 cubic yards in volume, and disposing of the same, the sum of \$40 for each cubic yard; for furnishing materials and building a pile dolphin, including painting and all incidental work, the sum of \$400.

Work under this contract is now in progress. Toward the cost of this work a contribution of \$3,750 was made by the city of Gloucester, and a contribution of the same amount by private interests.

Amount expended during the year, \$36,855.88.

Total expenditure to Dec. 1, 1919, \$70,756.33.

Harbor Cove.

Work under contract of June 3, 1918, with Thomas Fitzgibbon was completed Dec. 3, 1918, and consisted of dredging to a depth of 6 feet at mean low water a channel and basin to the public landing at the head of Harbor Cove. The cost of this work was \$3,412.80.

Amount expended during the year, \$2,494.46.

Total expenditure to Dec. 1, 1919, \$19,394.73.

LITTLE HARBOR, MARBLEHEAD.

Work under contract of Sept. 18, 1917, with George T. Rendle was completed May 22, 1919. This work consisted of the excavation to a depth of 6 feet at mean low water of a basin, about 92,000 square feet in area, between the southerly end of Browns Island and the mainland. The cost of this work was \$9,580.13.

Amount expended during the year, \$5,109.79.

Total expenditure to Dec. 1, 1919, \$11,166.16.

LYNN HARBOR AND SAUGUS RIVER.

On March 26, 1919, hearing was held on a petition of Fred A. Pilling and others, under chapter 481 of the Acts of 1909, for dredging a basin on the southerly side of Saugus River near its mouth at and near the location of the Point of Pines Yacht Club. After a report of the engineer with estimates of cost it was concluded to combine in one contract the dredging at Saugus River and the deepening and enlarging of the anchorage basin previously dredged in Lynn Harbor near the Nahant shore.

On July 28, 1919, a contract was made with the Bay State Dredging and Contracting Company, the contract prices being: for dredging the areas and disposing of the dredged material, including bowlders 1 cubic yard or less in volume, the sum of 67 cents for each cubic yard of material excavated and measured in the scows in which it is placed for transportation to the dumping ground; for excavating bowlders in excess of 1 cubic yard and not greater than 5 cubic yards in volume, and disposing of the same, the sum of \$20 for each cubic yard.

Work under this contract is now in progress.

Toward the cost of this work the city of Lynn made a contribution of \$2,500.

Total expenditure to Dec. 1, 1919, in Lynn Harbor, \$45,881.88.

Total expenditure to Dec. 1, 1919, in Lynn Harbor and Saugus River, \$9,201.19.

MANCHESTER HARBOR.

On March 26, 1919, hearing was held on a petition of the selectmen of Manchester, under chapter 481 of the Acts of 1909, for dredging the entrance to the channel in Manchester Harbor, the channel in Bow Bell Ledge and from the draw-bridge to the town landing. Toward the cost of this work the town of Manchester made a contribution of \$4,500. As work under contract of May 1, 1918, with the Bay State Dredging and Contracting Company for dredging shoals in this harbor was still in progress, it was continued to include this additional dredging. Work was completed May 3, 1919, when a channel

across the flats below Proctors Point, a basin above and below the railroad bridge, and a channel to the town landing had been redredged to a depth of 6 feet at mean low water.

The cost of this work was \$26,133.84.

Amount expended during the year, \$22,301.98.

Total expenditure to Dec. 1, 1919, \$109,078.51.

NEW BEDFORD STATE PIER.

By chapter 693 of the Acts of 1914 the Board of Harbor and Land Commissioners was authorized to reconstruct and extend the present southerly pier owned by the city of New Bedford, and to reconstruct the pier adjoining the same on the north; to build sheds or other buildings on said piers, and to provide the necessary equipment and appliances for handling freight and receiving passengers; to also fill solid and dredge, and to do such other work as might be necessary to carry out the purposes of the act for the improvement of the harbor and terminal facilities of the city of New Bedford. The appropriation was \$350,000.

The original contract for this pier was made with W. H. Ellis & Son Company Jan. 5, 1915. Attention is called to the annual reports of this Commission for 1916, 1917 and 1918.

Dredging. — During the year, under an agreement with John R. Burke, a shoal in the channel near the pier was removed at a cost of \$875.

Additional facilities. — On Nov. 1, 1918, a contract was entered into with the J. W. Bishop Company for building a one-story freight shed of wood with outside platforms, including a floor at the platform level in the shed at the head of the pier; widening the concrete platforms under the present shed at the end of the pier; and paving track space and driveway with concrete. Work was completed Feb. 6, 1919, at a total cost of \$63,328.42.

Two tracks were relaid in the steel shed and extended westerly in the new shed, furnishing room for 24 cars to load or discharge at the platforms, at a cost, including gravel, of \$7,183.51.

Main feed lines for power and lighting current were run inside the new shed in place of the temporary lines furnished by the power company, at a cost of \$966.28.

The installation of lights over platforms and track space in the immigration shed and over outside platforms, together with lines and receptacles for cargo lights on both sides of shed, was completed at a cost of \$886.

Additional toilets were installed in the immigration shed and in the steel shed at a cost of \$826.88.

The doors at the east end of the steel shed were rebuilt at a cost of \$205.29.

On Nov. 26, 1919, a contract was made with the F. S. Payne Company of Cambridge to furnish one electrically operated freight elevator of 9,000 pounds' capacity at a cost of \$4,796.

In order to comply with the requirements of the New England Insurance Exchange a contract was entered into with the General Fire Extinguisher Company of Providence, R. I., to equip the new one-story freight shed and the two-story immigration shed with a dry pipe system of automatic fire sprinklers, at a total estimated cost of \$7,338.

Operations during the year. — Miscellaneous dockage has been provided at 17 different periods of time ranging from 1 to 32 days; barges, 13 days; tugs and towboats, 6 days; lighters and dredge, 7 days; and schooners, 115 days; making a total period of 141 days. Included in above list are five schooners from the Cape de Verde Islands, which landed 194 passengers, the receipts being \$51. Vessels of the army and navy have used the pier at various times for which no charge was made, and they are not included in the above list.

The total amount of water supplied to vessels was 555,662 gallons at a charge of \$557.95. Miscellaneous receipts for old lumber sold and cement bags returned amounted to \$23.53.

The receipts and outstanding bills for the operation of this pier for the year are as follows: —

<i>Receipts.</i>	
Dockage,	\$761 00
Storage,	11,793 90
Water,	651 04
Passengers,	51 00
Miscellaneous,	23 53
	<hr/> \$13,280 47

Expenditures.

Construction,	\$73,396 38
Equipment,	601 83
Operation and maintenance,	6,269 26
	<hr/> \$80,267 47

Amount expended during the year, \$80,267.47.

Total expenditure to Dec. 1, 1919, \$443,085.71.

NOBSCUSSET HARBOR, DENNIS.

Work under contract of Nov. 6, 1918, with Jehiel R. Crosby and Joyce Taylor was completed March 25, 1919, at a cost of \$4,679.48.

This work consisted of extending the riprap wall back of the jetty at the westerly end of the basin easterly to the breakwater a distance of 140 feet, requiring the placing of 793.5 tons of stone to an elevation of about 10 feet above mean low water; and the excavation by horses and scrapers of a basin back of the breakwater of about 16,000 square feet in area, and a narrow channel to the end of the breakwater, all dredging being to a depth of 2 feet above mean low water, requiring the removal of 3,249 cubic yards of material.

On March 26, 1919, hearing was held on a petition of the selectmen of Dennis, under chapter 481 of the Acts of 1909, for a further increase in the height of this breakwater. No further action has been taken.

Amount expended during the year, \$5,275.46.

Total expenditure to Dec. 1, 1919, \$23,713.94.

PAMET RIVER, TRURO.

Work under contract of Oct. 7, 1918, with the Bay State Dredging and Contracting Company was completed Nov. 29, 1919.

This work was begun April 21, 1919, and consisted of dredging a channel about 60 feet wide on the bottom and 6 feet deep at mean low water from the 6-foot contour in Cape Cod Bay through the beach and marsh a distance of 2,945 feet to a basin which was excavated immediately west of the railroad station at Truro. The basin is about 150 feet wide on the bottom, 700

feet long parallel to the railroad, and 6 feet deep at mean low water. The marsh between the river and the channel and between the railroad and the basin, including a creek which emptied into the river near the railroad bridge, was filled with dredged material to about grade 15. Between the river and the channel this material was held in place by sod dikes to create a barrier to exclude the river from the channel and basin. Stone jetties were built on both sides of the entrance through the beach. The north jetty is 175 feet and the south jetty 80 feet in length. The north bank of the channel is riprapped for 300 feet from the jetty, and the south bank for 230 feet from the jetty. The river side of the sod dike is riprapped for a distance of 375 feet opposite the narrow portion of the barrier, and 75 feet of the dike immediately west of the railroad bridge is also protected with riprap. Toward the cost of this work an individual contribution of \$1,000 was made.

Amount expended during the year, \$171,472.91.

Total expenditure to Dec. 1, 1919, \$173,039.64.

POPPONESSET BAY AND WEST BAY.

On March 26, 1919, hearing was held on a petition of Charles L. Gifford and others, under chapter 481 of the Acts of 1909, for the extension of dredging previously done in Popponesset Bay.

On the same date hearing was held on petitions of C. A. Driscoll and others, under chapter 481 of the Acts of 1909, for repair and extension of jetties and for redredging channel at the entrance to West Bay.

It was concluded to do the desired dredging in these two localities under one contract, and on June 16, 1919, a contract was made with John R. Burke for dredging a channel at the entrance to and inside Popponesset Bay, and through the bar at the entrance to West Bay.

The contract prices for this work were: for dredging the channels and disposing of the dredged material, including boulders 1 cubic yard or less in volume, the sum of $63\frac{1}{2}$ cents for each cubic yard of material excavated and measured *in situ* or in the scows in which it is placed for transportation to the dumping ground; for excavating boulders in excess of 1 cubic

yard and not greater than 5 cubic yards in volume, and disposing of the excavated material, the sum of \$12.50 for each cubic yard.

Work under this contract is now in progress.

In August, 1919, the attention of the Commission was called to a shoal at the entrance to Seapuit River. After an examination and report by the engineer it was concluded to remove the shoal at the outlet into West Bay, in order that the increase of the flow into the bay might improve the depth in the river and enable it to be used by motor boats as a short cut between Cotuit Harbor and West Bay.

This work is to be done as part of the dredging under contract for work at West Bay.

Amount expended during the year at Popponesset Bay, \$16,029.10.

Amount expended during the year at West Bay, \$3,172.31.

Total expenditure to Dec. 1, 1919, at Popponesset Bay, \$31,492.13.

Total expenditure to Dec. 1, 1919, at West Bay, \$48,595.76.

SANDWICH HARBOR.

In the spring of 1919 the attention of the Commission was called to the effect of a severe storm which during the winter overturned a portion of the wooden bulkhead at the inshore end of the northerly jetty, broke through the dike which separates the new channel from the old, and caused some shoaling at the entrance between the jetties.

It seemed best to combine the work necessary at this harbor with that at Ellisville Harbor, and on May 19, 1919, a contract was made with the Boston Dredging Company for dredging a bar at the entrance between the jetties to at least 4 feet below mean low water westerly for a width of 50 feet, and for repairing the break in the dike across the old outlet with material dredged from the channel or from the bar.

The contract price was: for use of dredge "Kennebec," fully equipped and manned, to excavate a shoal at the entrance to Sandwich Harbor, Sandwich, and to excavate material from the channel and bar to repair the dike across the old channel, as directed by the engineer, the sum of \$500 for each calendar day,

exclusive of Sundays and holidays, required to perform the work, subject to reductions for loss of time as provided in the contract.

Work under this contract was completed June 19, 1919, at a cost of \$9,837.50.

Amount expended during the year, \$7,729.32.

Total expenditure to Dec. 1, 1919, \$80,579.84.

SESUIT HARBOR, DENNIS.

On March 26, 1919, hearing was held on a petition of the Sesuit Fish Freezing Company, under chapter 481 of the Acts of 1909, for dredging a channel in this harbor. After an examination and report by the engineer, the most practical method of improvement appeared to be the construction of a riprap jetty which would prevent the movement of sand in the channel from the north, and confine the tidal flow sufficiently to scour the shoal which has formed in the channel.

On June 30, 1919, a contract was made with Jehiel R. Crosby and Joyce Taylor to build a riprap jetty from the easterly shore on the northerly side of the entrance to the inner harbor.

The contract prices for this work were: for furnishing and placing stone in the jetty, including all incidental work, the sum of \$3.85 per ton of 2,000 pounds; for excavating foundation for jetty and disposing of the excavated material, including all incidental work, the sum of 85 cents per cubic yard measured *in situ*.

This work was completed Oct. 21, 1919, and consisted of the construction of a riprap jetty extending in a northwesterly direction parallel to the channel of the inner harbor a distance of 284 feet from the crest of the beach.

The top of the jetty is about 5 feet wide, and is at an elevation of 12 feet above mean low water, or from 4 to 5 feet above the surface of the bottom. The sides are built roughly to a 1 to 1 slope, and the voids between the large stone are filled with small stone to make it compact and prevent the passage of sand through the structure.

The purpose of the jetty is to confine the tidal flow and thus create a scour that will deepen the channel, and also to prevent the movement of sand into the channel from the flat to the north by northwesterly storms.

Toward the cost of this work a contribution of \$500 was made by the Sesuit Fish Freezing Company.

Amount expended during the year, \$3,360.07.

Total expenditure to Dec. 1, 1919, \$24,041.60.

WAQUOIT BAY, FALMOUTH AND MASHPEE.

In October, 1919, an examination of the work previously done by the Commission showed the necessity for the placing of additional stone in the breakwater at the entrance to the bay and upon the outer spur jetty on the east side of the outer end of the bulkhead.

On Oct. 29, 1919, a contract was made with E. S. Belden & Sons, Incorporated, for placing additional stone in the bulkhead to fill spaces and prevent the passage of sand through the structure, and the building of a short spur jetty on the easterly side of the inshore end.

The contract price for this work was: for furnishing the stones and depositing them in place in the breakwater, the sum of \$7.50 per ton of stones in place.

Work under this contract is now in progress.

Amount expended during the year, \$1,921.01.

Total expenditure to Dec. 1, 1919, \$22,190.59.

WESTFIELD RIVER.

An examination of the spur jetties built by the Commonwealth in this river near the Old County Bridge showed the necessity for extending two of the jetties and for the addition of riprap to the inshore end of the most northerly jetty. Under an arrangement with the Woronoco Construction Company this work is now being carried out.

Total expenditure to Dec. 1, 1919, \$4,740.39.

YARMOUTHPORT HARBOR.

Work under contract of Oct. 7, 1918, with the Bay State Dredging and Contracting Company was completed Oct. 31, 1919, when a channel had been dredged 50 feet wide on the bottom and 6 feet deep at mean low water from the 6-foot contour in the main channel to the town landing at the mouth of Mill Creek, a distance of about 5,200 feet. During the year a

contribution of \$5,000 was made by the Bay State Freezer, Incorporated, toward the cost of the work.

Amount expended during the year, \$90,636.13.

Total expenditure to Dec. 1, 1919, \$90,777.37.

FEDERAL APPROPRIATIONS AND EXPENDITURES.

A statement covering Federal appropriations and expenditures for improvement of rivers and harbors in Massachusetts from the establishment of the government to the close of the fiscal year ending June 30, 1919, is printed in the Appendix, pages 81-83.

MISCELLANEOUS MATTERS.

GREAT PONDS.

Jurisdiction over great ponds belonging to the Commonwealth, these ponds containing in their natural state 10 or more acres of land, was conferred upon the former Board of Harbor and Land Commissioners by chapter 318 of the Acts of 1888, and further authority given that Board, by chapter 379 of the Acts of 1904, to sell and convey or lease any of the islands owned by the State in the great ponds, subject to the approval of the Governor and Council.

During the year the Commission has made examinations, held conferences or taken other proceedings relative to Ashumet Pond, Mashpee and Falmouth; Asnaconcomet Pond, Hubbards-ton; Big Alum Pond, Sturbridge; Billington Sea, Plymouth; Clear Pond, Carver; Farm Pond, Sherborn; Manchaug Pond, Sutton and Douglas; Monponsett Pond, Hanson; Morey's Hole Pond, Plymouth; Morse Pond, Wellesley; Swan Pond, Dennis; Wenham Lake, Wenham; White Island Pond, Plymouth and Wareham.

A list of the lakes and ponds of the State with areas of 10 or more acres, given by counties, is printed in the report of this Commission on "Water Resources of Massachusetts, 1918."

CONSERVING AND EQUALIZING THE FLOW OF WATER IN RIVERS
AND STREAMS.

By chapter 87 of the Resolves of 1918 a special commission on the water resources of the Commonwealth of Massachusetts was created, including in its membership the chairman of the Commission on Waterways and Public Lands, to investigate the water resources of the Commonwealth, and their report was printed as Senate Document No. 298 of 1919.

By chapter 359, Acts of 1909, chapter 564, Acts of 1912, and chapter 84, Resolves of 1917, co-operation was established between the Commonwealth and the Water Resources Branch of the United States Geological Survey, whereby data relating

to the gauging of streams within the Commonwealth and other work of a similar character carried on by the said survey has been obtained for use by the Commission, said data being available for other departments of the Commonwealth.

The total amount spent to Dec. 1, 1919, on the investigation of conserving, utilizing and equalizing the flow of water in the rivers and natural streams of the Commonwealth is \$32,695.46, of which \$5,634.21 was spent during 1918 and 1919 for data relating to the gauging of streams referred to above. This total expenditure was authorized by chapter 95, Resolves of 1914, chapter 113, Resolves of 1915, chapter 84, Resolves of 1917, and chapter 87, Resolves of 1918.

PROVINCE LANDS.

The territory known as the Province Lands in Provincetown, belonging to the Commonwealth, and over which the former Board of Harbor and Land Commissioners were given general care and supervision by the provisions of chapter 470 of the Acts of 1893, comprises about 3,290 acres lying northerly and westerly of the line described in that act.

Reclamation work on these lands was begun in 1894, and has been carried on under the direction of a superintendent during each succeeding year. To prevent movement of the sand two methods are used. The barren dunes are covered first with brush or planted with beach grass. This grass is pulled in bunches about 2 inches thick for transplanting in rows about 4 feet apart and 6 inches deep, and so transplanted lives between four and five years. The work of planting grass and of brushing the dunes is followed and reinforced by the transplanting of trees and shrubs.

During the year work on these lands has been continued in accordance with these methods. In the winter and fall of 1919 35 acres of sand dunes were covered with brush. In the spring 10 acres of bayberry were transplanted, and between April and July, 23,500 pines. In March and April gypsy-moth clusters were destroyed by the use of creosote, and the lands thoroughly cleared from the moths.

At the end of the drive, on the bluff overlooking the ocean, a parking area of 8,000 square feet was built during the sum-

mer for the use of automobiles. This area will accommodate about 75 cars at one time.

The sum of \$207.20 has been paid into the State treasury during the year, being the amount received from licenses issued to various parties to cultivate and pick cranberries on the bogs, and to mow meadow lands.

Amount expended during the year, \$5,124.87.

Total expenditures to Dec. 1, 1919, \$80,891.28.

MASSACHUSETTS ATLAS SHEETS AND TOWN BOUNDARY ATLASES.

Under authority of chapter 57, Resolves of 1890, chapter 42, Resolves of 1891, chapter 360, Acts of 1900, and chapter 69, Resolves of 1915, 2,769 atlas sheets of the map of the Commonwealth and 2 town boundary atlases have been sold during the year ending Nov. 30, 1919, for which \$405.20 was received and forwarded to the Treasurer and Receiver-General.

No atlases were delivered during the year under the authority of chapter 360, Acts of 1900, as amended by chapter 484, Acts of 1909.

RE-ESTABLISHMENT OF CERTAIN TRIANGULATION POINTS.

By chapter 223 of the General Acts of 1915 the Board of Harbor and Land Commissioners was authorized to make such surveys and do such other work as may be required by any order of the Land Court, to re-establish and permanently mark certain stations previously established in connection with the topographical survey of the Commonwealth and the town boundary survey, which have been lost or destroyed, and to obtain the geographical position of such new points and stations as may be required from time to time by the court. The Board was allowed to expend not exceeding \$1,000 from the sum of \$1,500 which may be annually paid out of the State treasury.

The Commission reports that during the year ending Nov. 30, 1919, the location of the following triangulation stations was determined and their geographical positions furnished to the Land Court: 9 stations and 12 bound stones in the town of Falmouth; 3 stations in the town of Wilmington; 1 station and

3 bound stones in the town of Braintree; and 7 stations in the city of Lynn. The positions of 6 stations near the Massachusetts-New Hampshire line were recomputed. The following triangulation stations were marked with a composition plate bolted to ledge: stations Beebe, Fassett, Fay, Fay's Knob, Gifford, Kimball, Oyster Pond, Pit, Prosser, Quissett, Roadside, Whit and Whittemore in Falmouth; stations Beach-2 and Jet in Barnstable; station High Rock-2 in Lynn; and stations Chemical, Kelly Hill and O'Brien in Wilmington.

Amount expended during the year, \$969.42.

Total expenditure to Dec. 1, 1919, \$4,708.19.

CAPE COD CANAL.

Under the provisions of chapter 448 of the Acts of 1899, incorporating the Boston, Cape Cod & New York Canal Company, the Board of Railroad Commissioners and the Board of Harbor and Land Commissioners were constituted a Joint Board for the purposes defined in said act. The Commission on Waterways and Public Lands, since Aug. 3, 1916, have, with the Public Service Commission, exercised the powers and duties of the Joint Board. John N. Cole was elected chairman of the Joint Board on Aug. 30, 1916.

The act of 1899 was amended by chapter 476 of the Acts of 1900. Additional legislation is contained in chapter 519 of the Acts of 1910, and in chapter 184 of the General Acts of 1917. Statements covering previous proceedings of the Joint Board, the Board of Harbor and Land Commissioners, the Commission on Waterways and Public Lands, and the Joint Commission established by chapter 184 of the General Acts of 1917, with reference to this canal, are contained in the reports of the Board of Harbor and Land Commissioners for the years 1907, pages 98 to 104; 1909, pages 17 to 19; 1910, pages 34 to 38; 1911, pages 65 to 68; 1912, pages 74 to 77; 1913, pages 160 to 162; 1914, pages 87 to 91; 1915, pages 106 to 108; and in the reports of the Commission on Waterways and Public Lands for the years 1916, pages 99 to 101; 1917, pages 58 to 62; and 1918, pages 44 to 51.

LICENSES GRANTED DURING THE YEAR.

Nos.

233. Petition of Edwin Bradford Holmes for license to maintain a pile pier and floats in connection therewith in Hingham Bay, Hull. Granted Dec. 11, 1918.
234. Petition of the Gloucester Cold Storage and Warehouse Company for license to widen its wharf on piles in Harbor Cove, Gloucester. Granted Dec. 23, 1918.
235. Petition of James W. Douglas for license to build a pile and timber bulkhead in Hingham Bay, Hull. Granted Jan. 15, 1919.
236. Petition of the Boston, Revere Beach & Lynn Railroad Company for license to build pile and timber bulkheads and fill solid in Boston Harbor near Thornton Station, Winthrop. Granted Jan. 29, 1919.
237. Petition of Mary T. Shumway, Ethel N. Shumway and Harold H. Shumway, heirs of Nelson Shumway, for license to build a pile and timber bulkhead and fill solid on Fort Point Channel, Boston. Granted Feb. 3, 1919.
238. Petition of Morris Rudnick and A. I. Rudnick for license to build a pile and timber bulkhead and piers for the support of a structure on Fort Point Channel, Boston. Granted Feb. 3, 1919.
239. Petition of the Revere Sugar Refinery for license to construct intake and discharge pipes and do other work for securing salt water for condensing apparatus at and near its wharf property on Mystic River, Boston. Granted Feb. 19, 1919.
240. Petition of the New Bedford Gas and Edison Light Company for license to build four pile dolphins and to dredge in Acushnet River, New Bedford. Granted Feb. 19, 1919.
241. Petition of the Boston Molasses Company for license to fill solid in Boston Harbor at and near the junction of Farragut Road and East First Street, and near the Reserved Channel at South Boston. Granted March 5, 1919.
242. Petition of the Board of Commissioners on Fisheries and Game for approval of plans for a fishway on the southerly side of Merri-mack River at and near the dam of the Essex Company, Lawrence, as authorized by chapter 174 of the General Acts of 1918. Granted March 6, 1919.
243. Petition of Samuel T. Cahoon for license to build a pile pier in Woods Hole Great Harbor at Woods Hole, Falmouth. Granted March 6, 1919.
244. Petition of the Trustees of the National Dock Trust for license to build a pile wharf and place riprap or ballast in a dock in Boston Harbor at East Boston. Granted March 12, 1919.
245. Petition of Walter O. Luscombe for license to build three pile dolphins in Woods Hole Great Harbor at Woods Hole, Falmouth. Granted March 12, 1919.

Nos.

246. Petition of John Duff for license to extend his wharf on piles on Acushnet River at Fish Island, New Bedford. Granted March 12, 1919.
247. Petition of the city of New Bedford for license to build a pile and timber fender pier and pile dolphins at each of the rest piers in Acushnet River in that part of the New Bedford and Fairhaven bridge between Pope's Island and Fish Island, New Bedford. Granted March 12, 1919.
248. Petition of Gracie M. Southwick for license to build a pile pier and to extend and maintain an existing structure on concrete piers in Lynn Harbor, Nahant. Granted March 19, 1919.
249. Petition of B. R. Pollock, Federal manager of the Boston & Maine Railroad, acting for and on behalf of the United States Railroad Administration, for license to rebuild the Boston & Maine Railroad bridge No. 10 across Connecticut River in Holyoke and Chicopee. Granted April 2, 1919.
250. Petition of Mattie E. Brackett for license to build a sea wall and fill solid in Marblehead Harbor, Marblehead. Granted April 2, 1919.
251. Petition of the South Boston Yacht Club for license to extend its pier on piles in Dorchester Bay, South Boston. Granted April 2, 1919.
252. Petition of Walker D. Hines, Director-General of Railroads, operating the Boston & Maine Railroad, for license to rebuild Boston & Maine Railroad bridge No. 35 across Merrimack River, Haverhill. Granted April 2, 1919.
253. Petition of Thomas E. Reed for license to extend his wharf on piles in Gloucester Harbor at East Gloucester, Gloucester. Granted April 10, 1919.
254. Petition of S. Willard Thayer for license to build an inlet and an outlet sluiceway and a pump house for the purpose of drawing water from Hinecleys Pond, Harwich, to flow a cranberry bog. Granted April 10, 1919.
255. Petition of Andrew H. Bearse for license to build concrete bulkheads and fill solid in Stage Harbor, Chatham. Granted April 10, 1919.
256. Petition of the Holyoke Street Railway Company for license to lay submarine cables and ground wires in and under Connecticut River, Chicopee and Holyoke. Granted April 14, 1919.
257. Petition of the Boston Consolidated Gas Company for license to build a pile and timber bulkhead and fill solid in Dorchester Bay, Boston. Granted April 28, 1919.
258. Petition of Lillian D. Jones for license to build a wharf and float in Nantucket Sound at Wianno, Barnstable. Granted April 28, 1919.
259. Petition of the William H. Hart Realty Company for license to build a pile and timber bulkhead and pile and timber jetties, and

Nos.

- to dredge in Nantucket Sound and in a harbor connected with said sound, in Oak Bluffs. Granted May 7, 1919.
260. Petition of New Bedford Yacht Club for license to extend its pier in Apponagansett harbor, Dartmouth. Granted May 12, 1919.
- 260A. Petition of Wilfred A. Tillson, Mabel F. Borek, Alice C. Tillson and Blanche K. Newcomb for license to erect structures and draw water from Clear Pond, Carver, in connection with cranberry culture. Granted May 14, 1919.
- 260B. Petition of M. E. Palmer and C. M. Waters for license to construct and maintain a pumping plant, an intake or flume, and to draw water from Clear Pond, Carver, in connection with cranberry culture. Granted May 14, 1919.
261. Petition of the city of New Bedford for license to extend the Howland Street sewer and to build a timber and riprap bulkhead and to fill solid for the purposes of a wharf in Acushnet River, New Bedford. Granted May 19, 1919.
262. Petition of the Winnisimmet Ship Yard, Incorporated, and the trustees of the Winnisimmet Land Trust for license to dredge and excavate and build a marine railway in Chelsea Creek, Chelsea. Granted May 26, 1919.
263. Petition of John P. Squire & Co. for license to build an addition to its pumping station and do other work in Millers River, Somerville. Granted June 4, 1919.
264. Petition of B. R. Pollock, Federal manager of the Boston & Maine Railroad, United States Railroad Administration, for license to reconstruct draw No. 8 in the Boston & Maine Railroad bridge, Portland Division, West, across Mystic River, in Somerville and Medford. Granted June 16, 1919.
265. Petition of James H. Murphy for license to build a pile and timber bulkhead in Hingham Bay, Hull. Granted June 16, 1919.
266. Petition of the Springfield Gas Light Company for license to relocate a portion of its gas main across Connecticut River and to build a riprap retaining wall and fill solid in said river in Springfield and West Springfield. Granted June 16, 1919.
267. Petition of the Newburyport Gas and Electric Company for license to build a concrete intake well, a pile and plank bulkhead, and to fill solid in Merrimack River, Newburyport. Granted June 25, 1919.
268. Petition of the Boston & Lockport Block Company for license to build a pile and timber bulkhead and to fill solid on Chelsea Creek at East Boston. Granted July 2, 1919.
269. Petition of the Standard Oil Company of New York (East Providence Works) for license to build control gates, including foundation and walls, in Runnins River, in Seekonk, and to dredge in said river. Granted July 9, 1919.

Nos.

270. Petition of the Falmouth Oyster Company for license to build a pile pier in Falmouth Inner Harbor, Falmouth. Granted July 14, 1919.
271. Petition of the Director-General of Railroads for license to rebuild on piles the present railroad bridge across Three Mile River on the location of the New York, New Haven & Hartford Railroad, Dighton. Granted July 14, 1919.
272. Petition of Beulah P. Paine and Rene E. Paine for license to build a pile pier in Nantucket Sound at Wianno, Barnstable. Granted July 14, 1919.
273. Petition of the East Harbor Fertilizer Company for license to build a pile pier in Cape Cod Bay, Truro. Granted July 14, 1919.
274. Petition of C. Chester Eaton for license to build a temporary pier in Duxbury Bay, Duxbury. Granted July 21, 1919.
275. Petition of the city of Boston, by its commissioner of public works, for license to lay a 12-inch water pipe in Boston Harbor, from Moon Island to Long Island, Boston and Quincy. Granted July 28, 1919.
276. Petition of James L. Bryne for license to build concrete and timber wharves and piers and bulkheads, to dredge and to fill solid for the purposes of a ship repair plant in Boston Harbor, westerly of and near Meridian Street bridge at East Boston. Granted Aug. 11, 1919.
277. Petition of Harry W. Aiken for license to build and maintain a timber pier in Billington Sea, Plymouth. Granted Aug. 26, 1919.
278. Petition of the town of Amesbury, by its board of sewer commissioners, for license to lay an 8-inch water pipe across Powow River in Amesbury. Granted Aug. 26, 1919.
279. Petition of the Haverhill Electric Company for license to lay and maintain a submarine cable in Merrimack River across the drawways in the Haverhill-Bradford bridge, Haverhill. Granted Aug. 26, 1919.
280. Petition of the Metropolitan Park Commission for license to fill solid in Charles River Basin at the Charles River Reservation, Newton. Granted Aug. 26, 1919.
281. Petition of Elizabeth R. Holmes for license to build two pile dolphins in Acushnet River, New Bedford. Granted Sept. 16, 1919.
282. Petition of Edward H. R. Green for license to build a marine railway in Apponagansett Harbor, Dartmouth. Granted Sept. 16, 1919.
283. Petition of the East Harbor Fertilizer Company for license to build a pile wharf in Cape Cod Bay, Truro. Granted Sept. 16, 1919.
284. Petition of the town of Hull, by its board of selectmen, for license to extend the present outlet pipe of a sewer in Boston Harbor at the outer end of Glover Avenue at Allerton, Hull. Granted Sept. 16, 1919.

Nos.

285. Petition of the county commissioners of Essex County for approval of plans for rebuilding the bridge over Ipswich River at High Street, Topsfield, as authorized by chapter 302 of the General Acts of 1919. Approval signed Sept. 16, 1919.
286. Petition of the New England Oil Refining Company for license to build a pile wharf, a pile trestle and four pile dolphins on Taunton River, Fall River. Granted Sept. 17, 1919.
287. Petition of John R. McGinley and Jennie A. McGinley for license to build a sea wall and fill solid in Manchester Harbor, Manchester. Granted Sept. 24, 1919.
288. Petition of the Philadelphia & Reading Coal and Iron Company for license to make repairs and extensions at its wharf on Acushnet River, New Bedford. Granted Sept. 24, 1919.
289. Petition of the New York, New Haven & Hartford Railroad Company for license to build a retaining wall and fill solid back of the same on Connecticut River, Springfield. Granted Oct. 3, 1919.
290. Petition of Richard T. Crane, Jr., for license to build pile and timber bulkheads, pile pier and float, and to fill solid on Castle Neck River, Ipswich. Granted Oct. 3, 1919.
291. Petition of the board of trustees of the Boston Elevated Railway Company for license to dump snow into tide waters of Boston Harbor. Granted Oct. 3, 1919.
292. Petition of the Massachusetts Oil Refining Company for license to build a pile and timber bulkhead, pile platforms, to fill solid and to dredge in Weymouth Fore River, Braintree. Granted Oct. 8, 1919.
293. Petition of the Michigan Tanning and Extract Company for license to fill solid in Boston Harbor near the Reserved Channel at South Boston. Granted Oct. 15, 1919.
294. Petition of the city of Boston, by its commissioner of public works, for license to dump snow into tidewaters of Boston Harbor. Granted Oct. 17, 1919.
295. Petition of the Gorton-Pew Fisheries Company for license to build a bulkhead and pile structures and to fill solid in Gloucester Harbor, Gloucester. Granted Oct. 27, 1919.
296. Petition of the Gorton-Pew Fisheries Company for license to build a pile structure in Gloucester Harbor, Gloucester. Granted Oct. 27, 1919.
297. Petition of the Acushnet Process Company, Incorporated, for license to build a bulkhead and inlet screen chamber, to fill solid and to excavate a channel in Acushnet River, Acushnet. Granted Nov. 7, 1919.
298. Petition of James H. Foster for license to build pile and timber jetties in Nantucket Sound at Harwichport, Harwich. Granted Nov. 28, 1919.
299. Petition of the New England Oil Refining Company for license to build a sea wall, bulkheads, a pile wharf, to fill solid and to dredge on Acushnet River, New Bedford. Granted Nov. 28, 1919.

MISCELLANEOUS PERMITS GRANTED DURING THE YEAR.

THOMAS FITZGIBBON, acting for and in behalf of the Fred L. Davis Company, to dredge in the dock adjoining wharf of said company in Gloucester Harbor, Gloucester. Granted Dec. 4, 1918.

THE UNITED STATES OF AMERICA, to lay an electric conduit in Dry Dock Avenue and Harbor Street, South Boston. Granted Jan. 3, 1919.

THOMAS FITZGIBBON, acting for and in behalf of the Gorton-Pew Fisheries Company, to dredge two areas adjoining wharf of said company in Gloucester Harbor, Gloucester. Granted Jan. 3, 1919.

THE ATLANTIC WORKS, to dredge the berth in the slip on the northerly side of its southerly wharf at East Boston. Granted Jan. 8, 1919.

LEWIS WHARF COMPANY, to dredge the berth on the southerly side of Lewis Wharf in Boston Harbor. Granted Jan. 15, 1919.

BOSTON SAND AND GRAVEL COMPANY, to dredge material at the mouth of Merrimack River and Ipswich River and in Annisquam River beyond the line of riparian ownership. Granted Jan. 22, 1919.

WILLIAM M. MUNROE, to dredge material at the mouth of Merrimack River beyond the line of riparian ownership. Granted Jan. 22, 1919.

BETTS BROTHERS & Co., to deposit material at the East Boston receiving station or the South Boston receiving station. Granted Jan. 22, 1919.

BOSTON & MAINE RAILROAD, to dredge its berth on the southwesterly side of Pier 43 of the Hoosac Tunnel Docks at Charlestown. Granted Jan. 29, 1919.

BOSTON SAND AND GRAVEL COMPANY, to deposit material at the East Boston receiving station or the South Boston receiving station. Granted Feb. 10, 1919.

BAY STATE FISHING COMPANY, to dredge a berth alongside its wharf near the corner of Sumner and New streets, East Boston. Granted Feb. 18, 1919.

FREDERICK D. FISK, DANIEL R. SORTWELL AND THEODORE HOAGUE, TRUSTEES, to dredge material from their flats in Charles River Basin, Cambridge. Granted Feb. 19, 1919.

THE HODGE BOILER WORKS, to dredge the berth alongside its wharf at East Boston. Granted March 6, 1919.

BURTON-FURBER COAL COMPANY, to dredge the northerly dock at its premises at East Boston. Granted March 6, 1919.

BOSTON DREDGING COMPANY, to deposit material at the East Boston receiving station or the South Boston receiving station. Granted March 17, 1919.

J. S. PACKARD DREDGING COMPANY, to deposit material at the East Boston receiving station or the South Boston receiving station. Granted March 17, 1919.

BAY STATE DREDGING AND CONTRACTING COMPANY, to deposit material at the East Boston receiving station or the South Boston receiving station. Granted March 17, 1919.

BAY STATE DREDGING AND CONTRACTING COMPANY, to dredge the berth alongside its wharf in Chelsea Creek. Granted March 19, 1919.

MARITIME COALING COMPANY, to dredge berths at its coal wharf in East Boston. Granted March 19, 1919.

BOSTON & MAINE RAILROAD, to dredge the docks alongside Piers Nos. 41 and 44 of the Hoosac Tunnel docks, Charlestown. Granted March 28, 1919.

SELECTMEN OF THE TOWN OF HULL, to remove sand from the beach on the southerly side of the supply pier at Pemberton, Hull. Granted April 21, 1919.

CITY OF BOSTON, by its board of Park and Recreation Commissioners, to dredge an area in Neponset River in front of its Tenean Beach property at Neponset. Granted April 21, 1919.

H. I. MABBETT, to remove material from the shore in front of his property on Plymouth Harbor, Plymouth. Granted May 5, 1919.

COLONIAL STEEL COMPANY, to deposit material on the Commonwealth's flats at South Boston. Granted May 5, 1919.

GREAT LAKES DREDGE AND DOCK COMPANY, to deposit certain dredged material at Quincy Point. Granted May 5, 1919.

HALLET & DAVIS PIANO COMPANY, to dredge a berth alongside its berth in Neponset River, near Granite Avenue bridge. Granted May 5, 1919.

THE FALL RIVER ELECTRIC LIGHT COMPANY, to dredge in Taunton River, Fall River. Granted May 7, 1919.

N. WARD COMPANY, to do certain dredging on the easterly side of Spectacle Island in Boston Harbor. Granted May 12, 1919.

THE BALDWIN SHIPPING COMPANY, INCORPORATED, to use and occupy the trolley freight station and terminal at South Boston. Granted April 1, 1919.

THE STAPLES COAL COMPANY, to dredge the berth on the northerly side of its wharf in Mount Hope Bay, Fall River. Granted May 26, 1919.

JAMES E. GRAVES, to dredge in Little Harbor, Marblehead. Granted May 26, 1919.

SAMUEL KNIGHT SONS COMPANY, to dredge an area in front of the wharf of said company in Manchester Harbor, Manchester. Granted June 4, 1919.

W. B. CALDERWOOD, to dredge an area in front of his wharf in Manchester Harbor, Manchester. Granted June 4, 1919.

JOHN H. DRISCOLL, Jr., to use and occupy Berry Island, so called, in Lake Winthrop, Holliston. Granted June 4, 1919.

J. L. HARRIS, CHIEF BOATSWAIN'S MATE, U. S. N., to erect a tent on the Commonwealth's land at South Boston near the corner of E and Summer streets, for use in connection with recruiting purposes. Granted June 12, 1919.

KEARNS CONSTRUCTION COMPANY, to use a lot of land on the Commonwealth's flats at South Boston. Granted June 25, 1919.

WINNISIMMET SHIP YARD, INC., to remove excavated material by dumping it in tidewater outside the sea wall at its premises, and to dredge the same and transport and dump it at the receiving basins established by the Commission at Jeffries Point, East Boston, or at City Point, South Boston. Granted June 25, 1919.

BOSTON TERMINAL REFRIGERATING COMPANY, to construct and maintain two cast-iron water pipes from its refrigerating plant in and under Commonwealth Pier No. 1, East Boston. Granted June 25, 1919.

BOSTON DREDGING COMPANY, to dredge a channel in Town River, Quincy. Granted July 2, 1919.

CITY OF BOSTON, by its commissioner of public works, for modification of the provisions of license No. 63 granted by the Commission to the city of Boston April 5, 1917. Granted July 9, 1919.

WILLIAM P. WHARTON, to use and occupy Grassy Island in Baddacook Pond, Groton. Granted July 16, 1919.

THE SALEM ELECTRIC LIGHTING COMPANY, to dredge an area in South River, Salem. Granted July 21, 1919.

BOSTON SAND AND GRAVEL COMPANY, for extension of time for completion of dredging in Merrimack River, Ipswich River and Annisquam River, authorized by permit of Jan. 22, 1919. Granted July 23, 1919.

WILLIAM M. MUNROE, for extension of time for dredging in Merrimack River, authorized by permit of Jan. 22, 1919. Granted July 23, 1919.

CITY OF BOSTON, by its board of public works, to dredge in the channel between the ship channel and the deposit sewer at the Calf Pasture pumping station. Granted July 28, 1919.

THE LYNN GAS AND ELECTRIC COMPANY, to dredge the berth in front of its wharf, and to remove certain shoals from the channel leading thereto in Lynn Harbor. Granted July 28, 1919.

ATLANTIC WORKS, to dredge at its yard on the westerly side of East Boston. Granted July 28, 1919.

H. B. PARKER, to use and occupy an island in Big Alum Pond, Sturbridge. Granted Aug. 4, 1919.

FRED T. LEY & Co., INC., to use a lot of land on the Commonwealth's flats at South Boston. Granted Aug. 4, 1919.

KEARN'S CONSTRUCTION COMPANY, to use a lot of land on the Commonwealth's flats at South Boston. Granted Aug. 6, 1919.

GEORGE LAWLEY & SON CORPORATION, to dredge basins at its yacht building establishment in Neponset River at Neponset. Granted Aug. 8, 1919.

BENJAMIN FOX, INC., to deposit material at the receiving station at East Boston or the receiving station at South Boston. Granted Aug. 20, 1919.

DAVIES-TURNER COMPANY, to use and occupy a lot of land on the Commonwealth's flats at South Boston. Granted Aug. 20, 1919.

GENERAL ELECTRIC COMPANY, to dredge its dock in Saugus River, Lynn. Granted Aug. 26, 1919.

OSCAR C. DAVIS, to remove material from his beach at Sias Point, East Wareham. Granted Sept. 4, 1919.

WILLIAM R. FARRELL, to deposit material at the receiving station at East Boston or the receiving station at South Boston. Granted Sept. 8, 1919.

ABERTHAW CONSTRUCTION COMPANY, to dredge an area at the south end of its wharf on Marginal Street, Chelsea. Granted Sept. 16, 1919.

BAY STATE FREEZER, INC., to dredge channel to its wharf at Yarmouth-port. Granted Sept. 17, 1919.

FLORA H. BREED, to dredge a dock in Lynn Harbor, Lynn. Granted Oct. 3, 1919.

CITY OF BOSTON, by its public works department, to dredge at Stetson's dock, South Boston, and at the Calf Pasture, Dorchester. Granted Oct. 7, 1919.

THE BOARD OF TRUSTEES OF THE BOSTON ELEVATED RAILWAY COMPANY, to dump snow and ice on a portion of the Commonwealth's flats at South Boston. Granted Oct. 7, 1919.

BAY STATE DREDGING AND CONTRACTING COMPANY, to deposit dredged material at the dumping ground on the northerly side of Governors Island. Granted Oct. 22, 1919.

BAY STATE DREDGING AND CONTRACTING COMPANY, to deposit dredged material in a dredged basin in Weymouth Back River. Granted Oct. 22, 1919.

W. S. RENDLE, to dredge between the entrances to docks Nos. 2 and 3 of the Simpson's Patent Dry Dock Company at East Boston. Granted Oct. 24, 1919.

BOSTON ELEVATED RAILWAY COMPANY, to redredge the berth alongside its wharf at its Lincoln power station docks in Boston Harbor. Granted Nov. 3, 1919.

EDISON ELECTRIC ILLUMINATING COMPANY OF BOSTON, to erect two poles on a portion of the Commonwealth's flats at South Boston. Granted Nov. 24, 1919.

THE BOSTON & GLOUCESTER STEAMSHIP COMPANY, to dredge alongside its wharf in Gloucester Harbor. Granted Nov. 24, 1919.

FRANK C. PEARCE COMPANY, to dredge alongside and in front of its wharf in Gloucester Harbor. Granted Nov. 24, 1919.

JAMES E. GRAVES, for extension of time for completion of dredging in Little Harbor, Marblehead, authorized by permit of May 26, 1919. Granted Nov. 24, 1919.

BETTS BROTHERS & Co., to deposit material at the receiving station at East Boston or at the receiving station at South Boston. Granted Nov. 26, 1919.

PATRICK MCGOVERN, to use a parcel of land of the Commonwealth at Haywards Creek. Granted Nov. 28, 1919.

PATRICK MCGOVERN, to remove material from land of the Commonwealth at Haywards Creek. Granted Nov. 28, 1919.

FISH WEIR PERMITS APPROVED DURING THE YEAR.

- MONOMOY WEIR AND FISH COMPANY, INC. Permit issued by the selectmen of Chatham Nov. 5, 1918, to construct and maintain a fish weir in South Bay, in Chatham. Approved Dec. 11, 1918.
- GILBERT E. ELLIS. Permit issued by selectmen of Brewster Dec. 5, 1918, to construct two fish weirs in Cape Cod Bay. Approved Dec. 18, 1918.
- JAMES R. BAKER AND ROBERT CLARK. Permit issued by selectmen of Yarmouth Dec. 31, 1918, to construct and maintain a fish weir in the tidewaters of Yarmouth. Approved Jan. 8, 1919.
- LEVI W. D. ELDREDGE. Permit issued by selectmen of Chatham Jan. 16, 1919, to construct and maintain a fish weir in South Bay. Approved Jan. 22, 1919.
- BENJAMIN F. RICH. Permit issued by selectmen of Chatham Jan. 20, 1919, to construct and maintain a fish weir off Kidders Point in Bassing Harbor. Approved Jan. 29, 1919.
- E. CHESTER ELDREDGE. Permit issued by selectmen of Chatham Feb. 13, 1919, to construct and maintain a fish weir in Chatham Bay. Approved Feb. 19, 1919.
- BENJAMIN R. BAKER. Permit issued by selectmen of Chatham Feb. 13, 1919, to construct and maintain a fish weir in Pleasant Bay. Approved Feb. 19, 1919.
- E. CHESTER ELDREDGE. Permit issued by selectmen of Chatham Feb. 13, 1919, to construct and maintain a fish weir on the west side of Monomoy Beach. Approved Feb. 19, 1919.
- AUGUSTUS W. BAKER. Permit issued by selectmen of Chatham Feb. 6, 1919, to construct and maintain a fish weir in Pleasant Bay. Approved Feb. 19, 1919.
- ISALAH W. LONG. Permit issued by selectmen of Dennis Feb. 4, 1919, to maintain a fish weir in Nantucket Sound. Approved Feb. 19, 1919.
- DAVID N. KELLEY. Permit issued by selectmen of Fairhaven Feb. 17, 1919, to erect and maintain a fish weir in Buzzards Bay on the easterly side of Sconticut Neck. Approved Feb. 26, 1919.
- CHARLES E. F. BENSON. Permit issued by selectmen of Tisbury Feb. 15, 1919, to set and maintain a fish trap at the upper end of Lagoon Pond, Tisbury. Approved March 12, 1919.
- ROBERT P. NOCKEL. Permit issued by selectmen of Sandwich Feb. 15, 1919, to construct and operate two fish weirs in the tidewaters of Sandwich. Approved March 12, 1919.
- ARTHUR H. VANDERHOOP, JAMES F. COOPER and JOHN A. VANDERHOOP. Permit issued by selectmen of Gay Head March 3, 1919, to construct a fish weir, pound or fish traps in the upper part of Menamsha Pond. Approved March 12, 1919.
- GEORGE C. KING. Permit issued by selectmen of Gosnold Feb. 28, 1919, to construct a fish trap in a southwesterly direction from the southerly end of an island in Cuttyhunk. Approved March 12, 1919.

- DAVID T. BUTLER and JAMES A. MAYHEW. Permit issued by selectmen of Chilmark March 7, 1919, to construct and maintain a fish weir on the easterly side of Menamsha Pond. Approved March 19, 1919.
- BIDDLE R. THOMPSON. Permit issued by selectmen of Harwich Feb. 17, 1919, to construct and maintain a fish weir in Nantucket Sound. Approved March 19, 1919.
- RUFUS A. NICKERSON. Permit issued by selectmen of Chatham March 14, 1919, to construct and maintain a fish weir in Old Harbor. Approved March 19, 1919.
- ARTHUR W. KENDRICK. Permit issued by selectmen of Chatham March 6, 1919, to construct and maintain a fish weir in Nantucket Sound. Approved March 19, 1919.
- TIMOTHY W. BLACK. Permit issued by selectmen of Brewster March 15, 1919, to construct two fish weirs in Cape Cod Bay. Approved March 26, 1919.
- ISAAC J. MARCHANT. Permit issued by selectmen of Dennis March 21, 1919, to construct and maintain a fish weir in Nantucket Sound. Approved March 26, 1919.
- JOSEPH A. MANTA. Permit issued by selectmen of Provincetown March 12, 1919, to construct and operate a fish weir or trap in Provincetown Harbor. Approved March 26, 1919.
- JOSEPH A. MANTA. Permit issued by selectmen of Provincetown March 12, 1919, to construct and operate a fish weir or trap in Provincetown Harbor. Approved March 26, 1919.
- LINUS S. ELDRIDGE. Permit issued by selectmen of Mattapoisett March 18, 1919, to construct and maintain a fish trap in Buzzards Bay. Approved April 2, 1919.
- MICHAEL GASPAR. Permit issued by selectmen of Plymouth Feb. 4, 1918, to construct and maintain a fish trap in Plymouth Bay southerly from Saquish Neck. Approved April 2, 1919.
- FRED L. KNOWLES. Permit issued by selectmen of Truro March 1, 1919, to construct and maintain a fish weir in Cape Cod Bay. Approved April 2, 1919.
- HARRY E. HUNT. Permit issued by selectmen of Plymouth April 24, 1919, to set and maintain a fish trap in Plymouth Harbor. Approved April 28, 1919.
- EDWIN P. COOK. Permit issued by selectmen of Wellfleet Feb. 21, 1919, to construct and maintain a fish weir in Barnstable Bay. Approved May 12, 1919.
- MARINE BIOLOGICAL LABORATORY. Permit issued by selectmen of Gosnold May 8, 1919, to construct a fish trap or weir in Buzzards Bay near the shore of Naushon Island. Approved May 14, 1919.
- EUGENE W. HAINES. Permit issued by selectmen of Sandwich April 26, 1919, to construct and operate a fish weir in Cape Cod Bay. Approved May 19, 1919.

- MANUEL JAMES. Permit issued by selectmen of Provincetown March 12, 1919, to construct and operate a fish weir or trap in Provincetown Harbor. Approved May 28, 1919.
- CONSOLIDATED WEIR COMPANY, John A. Lewis, agent. Permit issued by selectmen of Provincetown March 12, 1919, to construct and operate a fish weir or trap in Provincetown Harbor. Approved May 28, 1919.
- JOSHUA PAINE. Permit issued by selectmen of Provincetown March 12, 1919, to construct and operate a fish weir or trap in Provincetown Harbor. Approved May 28, 1919.
- CONSOLIDATED WEIR COMPANY, John A. Lewis, agent. Permit issued by selectmen of Provincetown March 12, 1919, to construct and operate a fish weir or trap in Provincetown Harbor. Approved May 28, 1919.
- DEEP WATER TRAP COMPANY, Edwin N. Paine, agent. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Provincetown Harbor. Approved May 28, 1919.
- JOHN A. MATHESON, 2d. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir in Provincetown Harbor. Approved May 28, 1919.
- EDWIN N. PAINE. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Provincetown Harbor. Approved May 28, 1919.
- CAPE COD FISH PRODUCTS COMPANY. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Provincetown Harbor. Approved May 28, 1919.
- DEEP WATER TRAP COMPANY, Edwin N. Paine, agent. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Provincetown Harbor. Approved May 28, 1919.
- CAPE COD FISH PRODUCTS COMPANY. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Provincetown Harbor. Approved May 28, 1919.
- LONG POINT WEIR COMPANY. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Provincetown Harbor. Approved May 28, 1919.
- JOSHUA PAINE. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir in Provincetown Harbor. Approved May 28, 1919.
- LONG POINT WEIR COMPANY. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Provincetown Harbor. Approved May 28, 1919.
- JOSHUA PAINE. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Provincetown Harbor. Approved May 28, 1919.
- EDWIN N. PAINE. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Provincetown Harbor. Approved May 28, 1919.

- JOSHUA PAINE. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Provincetown Harbor. Approved May 28, 1919.
- JOHN A. MATHESON, 2d. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Provincetown Harbor. Approved May 28, 1919.
- JOHN A. MATHESON. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Herring Cove, Provincetown. Approved May 28, 1919.
- JOHN A. MATHESON. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Herring Cove, Provincetown. Approved May 28, 1919.
- JOSHUA PAINE. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Herring Cove, Provincetown. Approved May 28, 1919.
- JOSHUA PAINE. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Herring Cove, Provincetown. Approved May 28, 1919.
- JOSHUA PAINE. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Herring Cove, Provincetown. Approved May 28, 1919.
- WHITE BAR WEIR COMPANY, John A. Lewis, agent. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Herring Cove, Provincetown. Approved May 28, 1919.
- JOHN A. LEWIS, agent. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Herring Cove, Provincetown. Approved May 28, 1919.
- WILLIAM F. BAKER. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Herring Cove, Provincetown. Approved May 28, 1919.
- JOHN A. MATHESON, 2d. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Herring Cove, Provincetown. Approved May 28, 1919.
- JOHN A. MATHESON, 2d. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Herring Cove, Provincetown. Approved May 28, 1919.
- EDWIN N. PAINE. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Herring Cove, Provincetown. Approved May 28, 1919.
- WILLIAM F. BAKER. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Herring Cove, Provincetown. Approved May 28, 1919.
- JACKSON R. WILLIAMS. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Herring Cove, Provincetown. Approved May 28, 1919.

- WILLIAM F. BAKER. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Herring Cove, Provincetown. Approved May 28, 1919.
- JOSHUA PAINE. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Herring Cove, Provincetown. Approved May 28, 1919.
- JOSHUA PAINE. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Herring Cove, Provincetown. Approved May 28, 1919.
- JOSHUA PAINE. Permit issued by selectmen of Provincetown April 1, 1919, to construct and operate a fish weir or trap in Herring Cove, Provincetown. Approved May 28, 1919.
- BARTLETT E. BASSETT. Permit issued by selectmen of Chatham June 6, 1919, to construct and maintain a fish weir on the west side of North Beach, so called, in Chatham. Approved June 11, 1919.
- MARCUS N. HARRIS and ALFRED CROCKER. Permit issued by selectmen of Barnstable June 20, 1919, to set and maintain four fish weirs in the waters of Cape Cod Bay. Approved June 11, 1919.
- NATHANIEL H. WIXON. Permit issued by selectmen of Dennis June 10, 1919, to construct and maintain a fish weir in Nantucket Sound. Approved June 16, 1919.
- WILLIAM M. KENDRICK. Permit issued by selectmen of Chatham June 19, 1919, to set and maintain a fish fyke for eels in a creek above the dike that extends from Samuel Ryder's Island, so called, in Chatham. Approved June 16, 1919.
- NATHAN A. BUCK and HERBERT F. CAHOON. Permit issued by selectmen of Chatham June 16, 1919, to construct and maintain a fish weir in Chatham South Bay. Approved July 14, 1919.
- WILLIAM STOPFORD. Permit issued by city council of Salem June 5, 1919, to construct fish weirs or floating fish traps in tidewaters of Salem. Approved July 16, 1919.
- Mrs. J. MALCOLM FORBES. Permit issued by selectmen of Gosnold July 1, 1919, to construct and maintain a fish weir on the easterly side of Uncateena Island. Approved July 23, 1919.
- MARTHAS VINEYARD COLD STORAGE AND ICE COMPANY. Permit issued by selectmen of Tisbury July 22, 1919, to construct and maintain a fish weir in Vineyard Sound. Approved July 30, 1919.
- FRANK S. ROBBINS. Permit issued by selectmen of Brewster July 26, 1919, to construct and maintain a fish weir in Cape Cod Bay. Approved Aug. 4, 1919.
- ARTHUR D. FROST and ERNEST E. CRONK. Permit issued by selectmen of Marblehead July 23, 1919, to construct and maintain a floating trap off the southwest end of Tinkers Island. Approved Aug. 4, 1919.
- JAMES E. ELDRIDGE. Permit issued by selectmen of Brewster, July 26, 1919, to construct and maintain fish weirs in Cape Cod Bay. Approved Aug. 4, 1919.

- ARTHUR J. BARRETT & Co. Permit issued by selectmen of Nantucket May 7, 1919, to construct and maintain five fish weirs in "Chord of the Bay" at Nantucket. Approved Aug. 6, 1919.
- JACKSON R. WILLIAMS. Permit issued by selectmen of Provincetown July 23, 1919, to construct and operate a fish weir or trap in Provincetown. Approved Aug. 6, 1919.
- NATHAN A. BUCK and HERBERT F. CAHOON. Permit issued by selectmen of Chatham July 23, 1919, to construct and maintain a fish weir in Chatham South Bay. Approved Aug. 13, 1919.
- DAVID E. CURRAN. Permit issued by selectmen of Wellfleet Aug. 9, 1919, to erect and maintain two eel fykes in Herring River below Herring River dike. Approved Aug. 13, 1919.
- FRANK A. WILLIAMS. Permit issued by selectmen of Wellfleet Aug. 9, 1919, to erect and maintain two eel fykes in Herring River below Herring River dike. Approved Aug. 13, 1919.
- CHARLES HALE DOUGLASS. Permit issued by municipal council of Gloucester July 23, 1919, to construct and maintain a fish trap on the southerly side of Ten Pound Island. Approved Aug. 20, 1919.
- LEONARD B. DILL. Permit issued by selectmen of Wellfleet Aug. 23, 1919, to erect and maintain one eel fyke in Fresh Brook. Approved Sept. 4, 1919.
- ORICK D. YOUNG. Permit issued by selectmen of Chatham Aug. 20, 1919, to maintain a fyke for eels in Henry Harding's Creek, so called, on the north side of Oyster Pond River. Approved Sept. 4, 1919.
- OBADIAH W. HORTON. Permit issued by selectmen of Wellfleet Aug. 23, 1919, to erect and maintain two eel fykes in Silver Springs. Approved Sept. 4, 1919.
- MAURICE E. MAKER. Permit issued by selectmen of Wellfleet Aug. 23, 1919, to erect and maintain one eel fyke in Duck Creek, Wellfleet. Approved Sept. 4, 1919.
- RALPH E. COOK. Permit issued by selectmen of Wellfleet Aug. 23, 1919, to erect and maintain one eel fyke in Duck Creek, Wellfleet. Approved Sept. 4, 1919.
- RAYMOND S. HIGGINS. Permit issued by selectmen of Wellfleet Aug. 23, 1919, to erect and maintain one eel fyke at Fresh Brook. Approved Sept. 4, 1919.
- EDWIN P. COOK. Permit issued by selectmen of Wellfleet Sept. 13, 1919, to erect and maintain one eel fyke in Duck Creek, Wellfleet. Approved Sept. 17, 1919.
- JEREMIAH F. RICH. Permit issued by selectmen of Wellfleet Sept. 13, 1919, to erect and maintain one eel fyke in Black Fish Creek, Wellfleet. Approved Sept. 17, 1919.
- ALONZO F. CAHOON. Permit issued by selectmen of Chatham Sept. 15, 1919, to construct and maintain a fish weir in South Bay, so called. Approved Sept. 24, 1919.
- BERT W. BELL. Permit issued by selectmen of Wellfleet Sept. 20, 1919,

to erect and maintain one eel fyke in Black Fish Creek, Wellfleet.
Approved Sept. 24, 1919.

ALLIE ELLIS. Permit issued by selectmen of Brewster Sept. 23, 1919,
to construct one fish trap in Mill Creek, Brewster. Approved Oct. 3,
1919.

AUGUSTUS L. YOUNG. Permit issued by selectmen of Brewster, Sept. 23,
1919, to construct fish traps in Brewster, in Mill Creek, Quivet Creek
and in Namskaket Creek. Approved Oct. 3, 1919.

GEORGE N. BEARSE. Permit issued by selectmen of Chatham Oct. 9,
1919, to construct and maintain a fish weir in Chatham South Bay.
Approved Oct. 15, 1919.

The foregoing report is respectfully submitted.

JOHN N. COLE, *Chairman*,
JESSE B. BAXTER,
WILLIAM S. McNARY,
Commissioners.

APPENDIX

STATEMENT OF FINANCIAL CLERK, PORT FUNDS, DEC. 1, 1919.

INCOME OF HARBOR COMPENSATION FUND.

Balance of income, Nov. 30, 1918,	\$35,535 73
Accrued Dec. 1, 1918, to Nov. 30, 1919,	16,944 29
Amount in income of Harbor Compensation Fund Nov. 30, 1919,	\$52,480 02

HARBOR COMPENSATION FUND.

Amount in fund Nov. 30, 1918,	\$392,756 21
Receipts Dec. 1, 1918, to Nov. 30, 1919,	14,723 46
	\$407,479 67

Appropriation for investigation as to certain rivers of Boston Harbor (chapter 17, Resolves of 1919), \$20,000 00

Appropriation for investigation as to feasibility of bridge or tunnel, Boston to East Boston (chapter 51, Resolves of 1919, Item 329c, chapter 242, Special Acts of 1919), 10,000 00

Nov. 30, 1919, transferred to Port of Boston Fund,	30,000 00
	\$377,479 67
	377,479 67

PORT OF BOSTON FUND.

Chapter 663, Acts of 1912.

Balance Nov. 30, 1918,	\$1,495,647 58
Receipts Dec. 1, 1918, to Nov. 30, 1919,	506,951 81
	\$2,002,599 39

Receipts Nov. 30, 1919, transfer of Harbor Compensation Fund (chapter 143, General Acts of 1918),	377,479 67
	\$2,380,079 06

PORT OF BOSTON FUND — *Continued.*

Appropriation (chapter 153, Special Acts of 1919), personal services,	\$74,000 00	
Expenditures,	71,566 16	\$71,566 16
<hr/>		
Appropriation (chapter 153, Special Acts of 1919), office and incidental expenses,	\$7,300 00	
Expenditures,	5,987 39	5,987 39
<hr/>		
Appropriation (chapter 153, Special Acts of 1919), traveling expenses,	\$1,200 00	
Expenditures,	1,005 33	1,005 33
<hr/>		
Appropriation (chapter 153, Special Acts of 1919), publicity,	\$2,700 00	
Expenditures,	2,239 88	2,239 88
<hr/>		
Appropriation (chapter 153, Special Acts of 1919), operation and maintenance of Commonwealth Pier No. 5,	\$44,000 00	
Expenditures, 1919,	38,822 13	38,822 13
<hr/>		
Expenditures charged against Governor's extraordinary expense appropriation, 1917,	\$2,644 82	2,644 82
<hr/>		
Appropriation (chapter 153, Special Acts of 1919), repairing damages,	\$25,000 00	
Expenditures,	12,959 13	12,959 13
<hr/>		
Appropriation (chapter 153, Special Acts of 1919), triangulation points and stations,	\$1,000 00	
Expenditures,	969 42	969 42
<hr/>		
Appropriation (chapter 153, Special Acts of 1919), maintenance of Commonwealth's property,	\$55,000 00	
Expenditures,	43,866 34	43,866 34
<hr/>		

BOSTON HARBOR DREDGING.

Appropriation (chapter 348, Special Acts of 1917) from Harbor Compensation Fund, \$100,000 00

Expenditures.

	To Nov. 30 —		Total.
	1918.	1919.	
Dredging in Chelsea Creek,	\$29,653 19	\$26,913 33	\$56,566 52
Engineering,	1,385 91	2,036 44	3,422 35
Dredging opposite Simpson's Patent Dry Dock,	—	2,356 65	2,356 65
Engineering,	83 39	137 68	221 07
	<hr/>	<hr/>	<hr/>
	\$31,122 49	\$31,444 10	\$62,566 59
Unexpended balance Nov. 30, 1919,			<hr/>
			\$37,433 41

COMMONWEALTH FLATS DEVELOPMENT.

Appropriation (chapter 351, Special Acts of 1917) from Port of Boston Fund (receipts from sales of land), \$100,000 00

Expenditures, —

DEVELOPMENT OF THE PORT OF BOSTON LOAN FUND.

Bonds authorized by chapter 748, Acts of 1911, \$9,000,000 00

Bonds sold in 1913, \$3,000,000 00

Bonds sold in 1914, 3,000,000 00

Bonds sold in 1915, 1,000,000 00

Bonds sold in 1917, 1,000,000 00

Bonds sold in 1918, 1,000,000 00

DEVELOPMENT OF THE PORT OF BOSTON LOAN FUND — *Continued.**Expenditures.*

	To Nov. 30 —		Total.
	1918.	1919.	
HAYWARD'S CREEK.			
Engineering,	\$2,149 12	\$1,973 27	\$4,122 39
Taking,	91,693 91	76,950 66	168,644 57
	\$93,843 03	\$78,923 93	\$172,766 96
COMMERCIAL POINT, DORCHESTER BAY.			
Appropriation from Development of the Port of Boston Loan Fund (chapter 602, Acts of 1914), \$58,000.			
Contract work: —			
Commercial Point, dredging,	\$49,903 56	—	—
Freeport Street, dredging,	449 65	—	—
Engineering,	2,859 89	—	—
	\$53,213 10	—	\$53,213 10
DRY DOCK.			
Contract work: —			
Borings,	\$2,442 90	—	\$2,442 90
Construction,	1,383,894 47	\$732,978 79	2,116,873 26
Engineering,	105,343 19	103,902 24	209,245 43
	\$1,491,680 56	\$836,881 03	\$2,328,561 59
EAST BOSTON.			
Contract work: —			
Borings,	\$3,320 75	—	\$3,320 75
Dredging opposite Pier No. 1,	62,241 96	—	62,241 96

Jeffries Point ranges,	.	.	.	.	.	.	213 58		
Takings, .	.	.	.	.	.	.	1,354,877 21	—	1,354,877 21
Reclamation of flats,	.	.	.	.	.	.	520,731 77	—	520,731 77
Jeffries Point bulkhead,	.	.	.	.	.	.	75,488 32	\$27,500 00	102,988 32
Engineering, .	.	.	.	.	.	.	46,823 51	1,475 38	48,298 89
							\$2,063,697 10	\$28,975 38	\$2,092,672 48

SOUTH BOSTON.

Contract work:—

Bulkhead, ¹ .	.	.	.	.	.	.	\$178,014 06	—	\$178,014 06
Dredging and filling, ¹ .	.	.	.	.	.	.	278,608 36	—	278,608 36
Dredging Reserved Channel, ¹ .	.	.	.	.	.	.	31,461 08	—	31,461 08
Clearing army base, ¹ .	.	.	.	.	.	.	18,310 54	—	18,310 54
Engineering, ¹ .	.	.	.	.	.	.	43,272 59	—	43,272 59
Commonwealth Pier No. 5,	.	.	.	.	.	.	2,846,271 03	—	2,846,271 03
Commonwealth Pier No. 5 (miscellaneous and extra work), .	.	.	.	.	.	.	10,459 60	—	10,459 60
Miscellaneous painting,	.	.	.	.	.	.	8,540 00	—	8,540 00
Cargo hoists, .	.	.	.	.	.	.	12,042 00	—	12,042 00
Covering pipes,	.	.	.	.	.	.	3,949 00	—	3,949 00
Painting Kinnear doors and sprinkler pipes in head house,	.	.	.	.	.	.	295 00	—	295 00
Steel signs,	.	.	.	.	.	.	22 50	—	22 50
Viaduct, .	.	.	.	.	.	.	106,160 18	—	106,160 18
Viaduct foundation, .	.	.	.	.	.	.	127,981 81	—	127,981 81
Viaduct superstructure,	.	.	.	.	.	.	90,965 70	—	90,965 70
Viaduct tracks,	.	.	.	.	.	.	—	\$532 56	532 56
Dredging opposite Pier No. 5 and approaches,	.	.	.	.	.	.	137,323 41	—	137,323 41
Grain elevator "Golder," .	.	.	.	.	.	.	31,191 57	—	31,191 57

¹ Transferred from "Dry Dock."

QUINCY BAY SHORE (HOUGHS NECK SEA WALL).

Appropriation (chapter 376, Special Acts of 1917),	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	\$15,000 00
Contribution, city of Quincy,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5,000 00

\$20,000 00

To Nov. 30 —

1918.	1919.	Total.
-------	-------	--------

Contract work,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	\$5,440 00
Engineering,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1,791 08

\$393 55

\$7,231 08

Unexpended balance Nov. 30, 1919,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7,231 08
																				\$12,768 92

INVESTIGATION AS TO CERTAIN RIVERS IN BOSTON HARBOR.

Appropriation from Harbor Compensation Fund (chapter 17, Resolves of 1919; chapter 211, Special Acts of 1919),	\$20,000 00
--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	-------------

Expenditures:—

Engineering,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	Total.
																				\$815 26

Unexpended balance Nov. 30, 1919, \$15 26

\$19,184 74

INVESTIGATION AS TO FEASIBILITY OF BRIDGE OR TUNNEL, BOSTON TO EAST BOSTON.

Appropriation from Harbor Compensation Fund (chapter 51, Resolves of 1919, Item 329c, Chapter 242, Special Acts of 1919),	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	\$10,000 00
Appropriation by city of Boston,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10,000 00

\$20,000 00

Expenditures:—

1919.	Total.
-------	--------

Engineering,	\$930 66
--------------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	----------

Unexpended balance Nov. 30, 1919,

\$19,069 34

EXPENDITURES FOR DEVELOPMENT AND IMPROVEMENT IN BOSTON HARBOR, 1859-1919, INCLUSIVE.

PAYMENTS.	Boston Harbor.	Commonwealth Flats at East Boston.	Commonwealth Flats at South Boston.	Commonwealth Pier No. 5.	Dry Dock.	Hayward's Creek.	Mystic River.
To Nov. 30, 1918,	\$1,614 474 07	\$1,304,127 10	\$5,873,151 22	\$3,986,271 25	\$1,520,466 76	\$69,843 03	\$263,864 30
1919.							
Boston Harbor, dredging, appropriation (chapter 348, Special Acts of 1917).	2,494 33	-	-	-	-	-	-
Investigation as to certain rivers of Boston Harbor (chapter 17, Resolves of 1919).	-	-	-	-	-	-	425 01
Quincy Bay shore (chapter 363, Special Acts of 1917), . . .	393 55	-	-	-	-	-	-
Development of Port of Boston loan fund (chapter 748, Acts of 1911).	-	28,975 38	4,032 56	-	836,331 03	78,923 93	-
Port development appropriations (chapter 143, General Acts of 1918, and chapter 162, Special Acts of 1919).	-	274,130 02	171,422 15	-	604,297 72	87,051 40	-
Port of Boston fund: —							
Chapter 153, Special Acts of 1919,	-	-	-	-	-	-	-
Chapter 162, General Acts of 1919,	-	-	-	-	-	-	-
	\$1,617,361 95	\$1,607,232 50	\$6,048,603 93 ¹	\$3,986,271 25	\$2,961,645 51	\$259,818 36	\$264,289 31

¹ Includes cost of Commonwealth Pier No. 6, \$1,067,598.90.

EXPENDITURES FOR DEVELOPMENT AND IMPROVEMENT IN BOSTON HARBOR, 1859-1919, INCLUSIVE—*Concluded.*

	PAYMENTS.	Chelsea Creek.	Commercial Point, Dorchester Bay.	Com-monwealth Pier No. 1, East Boston.	Com-monwealth Pier No. 5, Operation and Maintenance.	Com-monwealth Pier No. 1, Operation and Maintenance.	Maintenance of Other Property of Common-wealth.
To Nov. 30, 1918,	\$31,039 10	\$53,213 10	\$961,951 88	\$237,460 25	-	\$66,445 97
1919.							
Boston Harbor, dredging, appropriation (chapter 348, Special Acts of 1917).		28,949 77	-	-	-	-	-
Investigation as to certain rivers of Boston Harbor (chapter 17, Resolves of 1919).		182 37	-	-	-	-	-
Quincy Bay shore (chapter 363, Special Acts of 1917),		-	-	-	-	-	-
Development of Port of Boston loan fund (chapter 748, Acts of 1911), .		-	-	-	-	-	-
Port development appropriations (chapter 143, General Acts of 1918, and chapter 162, Special Acts of 1919): —		-	-	147,961 51	-	-	-
Chapter 153, Special Acts of 1919,		-	-	-	38,822 13	-	43,866 34
Chapter 162, General Acts of 1919,		-	-	-	-	\$9,829 78	-
		\$60,171 24	\$53,213 10	\$1,109,913 39	\$276,282 38	\$9,829 78	\$110,312 31

Total, \$18,364,947.01.

APPROPRIATIONS, CONTRIBUTIONS AND EXPENDITURES FOR IMPROVEMENT OF SMALL HARBORS AND CHANNELS WITHIN BOSTON HARBOR, UNDER THE DIRECTION OF THE COMMISSION ON WATERWAYS AND PUBLIC LANDS, AND ITS PREDECESSORS, FROM 1893 TO 1919, INCLUSIVE.

LOCALITY.	Character of Work.	Total Appropriation.	Contributions by Municipality or Others.	Total Expenditure.
Cottage Park Channel, Winthrop.	Dredging, . . .	\$9,525 92	—	\$9,504 58
Dorchester, easterly shore, Boston.	Dredging, . . .	70,363 66	—	70,171 31
Harbor View, Boston, . . .	Dredging, . . .	10,146 00	—	146 00
Hingham Harbor, . . .	Dredging, . . .	13,180 69	\$3,000 00	16,180 69
Houghs Neck Channel, Quincy.	Dredging, . . .	26,952 54	1,500 00	28,452 54
Island End River, Everett, .	Survey, . . .	264 10	—	264 10
Jeffries Point Channel, . . .	Dredging, . . .	11,000 00	—	1,000 00
Mystic River (near Lawrence and Wiggin's Wharf).	Dredging, . . .	5,927 70	—	5,927 70
Neponset River, . . .	Dredging, . . .	43,951 12	—	43,950 38
Orient Heights Channels, .	Dredging, . . .	23,726 62	—	23,371 14
Pleasant Park Yacht Club Channel.	Dredging, . . .	3,033 96	—	3,033 96
Point Shirley, . . .	Dredging, . . .	1,150 00	—	1,150 00
Shirley Gut, Boston and Winthrop.	Dredging, . . .	1,906 20	—	1,906 20
South Boston, southerly shore,	Dredging, . . .	126,972 48	—	126,972 44
Stony Beach, Hull, . . .	Sea wall, . . .	11,607 90	—	11,335 07
Weir River, Hull, . . .	Dredging, . . .	35,663 13	—	35,663 13
Wessagusset Channel, . . .	Dredging, . . .	815 20	—	815 20
Weymouth Fore River, . . .	Dredging, . . .	46,838 34	—	31,913 85
Winthrop Harbor Channels, .	Dredging, . . .	27,878 74	700 00	26,624 16
Wollaston Channel, . . .	Dredging, . . .	34,052 64	—	33,631 25
Totals, . . .	. . .	\$504,956 94	\$5,200 00	\$472,013 70

CONTRIBUTIONS AND EXPENDITURES FOR RIVER AND HARBOR WORK FROM DEC. 1, 1918, TO NOV. 30, 1919, UNDER CHAPTER 481, ACTS OF 1909.

LOCATION.	Character of Work.	Contributions.	Expenditure.
Barnstable Harbor, . . .	Dredging, . . .	—	\$3,645 00
Bass River, Yarmouth, . . .	Filling basin, . . .	—	2,106 41
Bucks Creek, Chatham, . . .	Dredging and jetty, . . .	\$500 00	16,300 71

CONTRIBUTIONS, ETC. — *Concluded.*

LOCATION.	Character of Work.	Contributions.	Expenditure.
Connecticut River, Hadley, . . .	Diversion wall, . . .	-	\$4,335 22
Connecticut River, Holyoke, . . .	Marking and lighting old piers,	-	171 06
Connecticut River, West Springfield,	Riprapping bank, . . .	-	2,796 99
Ellisville Harbor,	Dredging,	-	25 20
Fall River Harbor,	Survey,	-	276 08
Falmouth Heights,	Sea wall,	\$2,000 00	14,656 68
Five Pound Island, Gloucester, . .	Dredging,	7,500 00	36,841 32
Gloucester Harbor,	Dredging,	-	14 56
Harbor Cove, Gloucester, . . .	Dredging,	-	2,494 46
Hull,	Sea wall,	-	20 00
Little Harbor, Marblehead, . . .	Dredging basin,	-	5,109 79
Lynn Harbor,	Dredging,	-	45,881 88
Lynn Harbor and Saugus River, . .	Dredging,	2,500 00	9,201 19
Manchester Harbor,	Dredging,	4,500 00	22,301 98
Merrimack River,	Survey,	-	82 33
New Bedford Harbor,	Dredging,	-	1,409 76
Newburyport Harbor,	Survey,	-	73 51
Nobscusset Harbor,	Dredging and riprap wall, . .	-	5,275 46
Oak Bluffs,	Sea wall,	-	3,556 11
Onset,	Survey,	-	223 00
Pamet River,	Dredging,	1,000 00	171,472 91
Popponesset Bay,	Dredging,	-	16,029 10
Rockport Harbor,	Survey,	-	41 69
Sandwich Harbor,	Dredging,	-	229 32
Scituate,	Sea walls,	-	267 20
Sesuit Harbor,	Jetty,	500 00	3,360 07
Taunton River-Massachusetts Bay Canal.	Survey,	-	114 66
Vineyard Haven Harbor, . . .	Repairing sea wall, . . .	-	324 45
Waquoit Bay,	Repairing breakwater, . . .	-	1,921 01
Warrens Cove, Plymouth, . . .	Survey,	-	20 00
West Bay,	Dredging,	-	3,172 31
Yarmouthport Harbor,	Dredging,	5,000 00	90,636 13
General,	- - -	-	2,637 82
		\$23,500 00	\$467,030 37

APPROPRIATIONS, CONTRIBUTIONS AND EXPENDITURES FROM 1893 TO 1918, INCLUSIVE, FOR RIVER AND HARBOR WORK, UNDER THE DIRECTION OF THE COMMISSION ON WATERWAYS AND PUBLIC LANDS, AND ITS PREDECESSORS TO NOV. 30, 1919 (EXCEPTING BOSTON HARBOR).

LOCALITY.	Character of Work.	Total Appropriation.	Contributions by Municipality or Others.	Total Expenditure.
Acushnet River, . . .	Inspection, . . .	\$2 15	-	\$2 15
Allens Harbor, Harwich, . .	Surveys, . . .	302 00	-	302 00
Allens Pond, Dartmouth, . .	Survey, . . .	195 95	-	195 95
Annisquam River, Gloucester,	Dredging, removing	107,630 63	-	107,260 75
Apponagansett Harbor and	ledges and riprap.			
River, Dartmouth.	Survey, dredging and	56,159 59	-	55,786 05
Barnstable Harbor, . . .	stone breakwater.			
	Survey and dredging,	17,392 18	\$1,500 00	18,554 64
Bass River, Beverly, . . .	Dredging, . . .	25,539 81	55,535 75	81,075 56
Bass River, Dennis and Yarmouth.	Jetties, dredging and	73,002 75	2,500 00	74,017 75
Brant Rock, Marshfield, . .	survey.			
	Sea wall, . . .	965 84	-	965 84
Bucks Creek, Chatham, . . .	Jetties, survey and	29,739 06	1,500 00	31,067 74
Buzzards Bay, Falmouth, . .	dredging.			
	Survey, . . .	166 11	-	166 11
Cataumet Harbor and Squeague Pond, Bourne and Falmouth.	Dredging, . . .	26,468 29	7,350 00	33,674 38
Centerville River, Barnstable, .	Dredging, . . .	6,103 22	1,500 00	7,603 22
Cohasset Harbor, Cohasset and Scituate.	Breakwater and dredging.	33,634 22	20,691 88	54,326 10
Concord River, Billerica, . .	Removing bowlders, .	1,514 59	150 00	1,664 59
Connecticut River, . . .	Investigation of navigation and surveys.	10,637 04	-	6,970 99
Connecticut River, . . .	Improvement, . . .	103 63	-	103 63
Connecticut River, Agawam, .	Protective work, . .	20,396 09	-	18,814 42
Connecticut River, Chicopee, .	Survey, wall and riprap.	25,149 02	640 00	25,789 02
Connecticut River, Hadley, . .	Protective work and diversion wall.	100,443 65	500 00	97,740 94 ¹
Connecticut River, Hatfield, .	Dikes and riprap, . .	14,751 82	1,000 00	14,952 57
Connecticut River, Holyoke, .	Marking and lighting old piers.	377 29	-	377 29
Connecticut River, Holyoke, .	Dredging and protective work.	18,815 78	415 00	4,230 78
Connecticut River, Northampton.	Protective work, . .	1,525 80	-	1,524 20
Connecticut River, South Hadley.	Wall, . . .	6,406 36	1,000 00	7,379 53
Connecticut River, West Springfield.	Protective work, . .	7,931 99	-	7,848 48 ²
Conservation of waters, . . .	Investigation, . . .	38,000 00	-	32,695 46
Cotuit Harbor, Barnstable, . .	Dredging and survey,	59,743 02	2,000 00	58,719 91
Cuttyhunk Harbor, Gosnold, .	Jetties and dredging, .	61,828 25	9,000 00	70,754 18
Deacons Pond Harbor, Falmouth.	Dredging, jetties and wall.	57,480 57	14,000 00	71,480 57
Duxbury Bay and Harbor, . .	Dredging, . . .	27,798 79	-	27,798 79

¹ From 1888, inclusive.² From 1891, inclusive.

APPROPRIATIONS, ETC. — *Continued.*

LOCALITY.	Character of Work.	Total Appropriation.	Contributions by Municipality or Others.	Total Expenditure.
East Bay, Osterville, . . .	Jetties, dredging and removing scows.	\$23,864 35	—	\$23,529 79
Edgartown Harbor, . . .	Survey, . . .	205 65	—	205 65
Ellisville Harbor, . . .	Dredging, . . .	11,256 82	—	11,256 82
Essex County beaches, . . .	Survey, . . .	1,000 00	—	1,000 00
Essex River, . . .	Dredging, . . .	5,000 00	—	5,000 00 ¹
Fall River Harbor, . . .	Improvement, . . .	350,290 54	—	1,130 18
Falmouth Heights, Falmouth, .	Sea wall, . . .	35,139 52	\$13,000 00	48,139 52
Glades, North Scituate, . . .	Survey, . . .	51 63	—	51 63
Gloucester Harbor, Gloucester,	Dredging and removing ledges.	63,256 33	7,500 00	70,756 33
Green Harbor, Marshfield, . .	Jetties, dredging and survey.	90,804 54	—	76,466 85
Gun Rock Point, Hull, . . .	Breakwater, . . .	48,096 11	10,000 00	58,096 11
Harbor Cove, Gloucester, . .	Survey and dredging,	18,528 73	866 00	19,394 73
Herring Creek, Scituate, . . .	Survey, . . .	253 76	—	253 76
Herring River, Harwich, . . .	Jetties and dredging, .	39,360 62	2,500 00	41,216 32
Herring River, Wellfleet, . .	Dikes and ditches, . .	11,832 74	10,000 00	21,800 73
Housatonic River, Sheffield, .	Survey, . . .	2,011 29	—	2,011 29
Hull, . . .	Sea wall and survey, .	25,258 32	8,882 06	34,140 38
Humarock Beach, Scituate, . .	Survey, . . .	250 00	—	236 07
Hyannisport, Barnstable, . .	Survey and breakwater.	49,988 82	2,500 00	52,488 82
Improvement of rivers and harbors.	General expenses, . .	6,992 82	—	6,992 82
Ipswich River, Ipswich, . . .	Jetty, wall, riprap and dredging.	46,884 26	1,000 00	47,877 70
Lake Anthony, Oak Bluffs, . .	Jetties and dredging, .	63,354 22	2,000 00	62,145 18
Lake Quannapowitt, Wakefield,	Investigation, . . .	1,004 21	—	345 32
Lewis Bay, Barnstable, . . .	Survey and dredging,	29,211 64	—	28,963 21
Little Harbor, Marblehead, . .	Dredging, . . .	8,666 16	2,500 00	11,166 16
Little River, Gloucester, . . .	Survey, . . .	862 93	—	862 93
Lobster Cove, Gloucester, . .	Dredging, . . .	17,603 98	1,500 00	19,103 98
Lynn Harbor, Anchorage Basin,	Survey and dredging,	108,783 55	5,200 00	108,582 33
Lynn Harbor and Saugus River,	Dredging and filling, .	89,272 31	37,500 00	126,772 31
Manchester Harbor, . . .	Survey, jetties and dredging.	68,100 67	43,500 00	109,078 51
Menamsha Inlet, Chilmark and Gay Head.	Jetties, dredging and sea wall.	63,423 34	700 00	64,019 69
Merrimack River, . . .	Investigation and survey.	751 59	—	651 59
Mill River, Gloucester, . . .	Survey and dredging,	24,632 86	300 00	24,899 59
Mitchells River, Chatham, . .	Survey, . . .	322 96	—	322 96
Nantucket Harbor, . . .	Dredging, . . .	42,058 63	1,000 00	42,779 78

¹ Expended by United States government.

APPROPRIATIONS, ETC. — *Continued.*

LOCALITY.	Character of Work.	Total Appropriation.	Contributions by Municipality or Others.	Total Expenditure.
New Bedford Harbor, . . .	Pier, shed and dredging.	\$371,782 16	—	\$354,205 81
New Bedford State Pier, . . .	Improvement of, . . .	73,461 00	—	73,436 38
New Bedford State Pier, . . .	Operation and maintenance.	20,000 00	—	16,853 23
Newburyport Harbor, . . .	Survey,	106 95	—	106 95
Nobscusset Harbor, Dennis, . . .	Breakwater, dredging and riprap.	31,874 49	\$1,200 00	23,713 94
North River, Marshfield, . . .	Surveys and removing rocks.	6,858 75	1,800 00	8,658 75
North River, Salem, . . .	Survey,	704 52	—	704 52
Oak Bluffs,	Removing rocks, . . .	632 45	—	594 95
Oak Bluffs,	Sea wall,	19,542 11	2,500 00	22,042 11
Onset Bay, Wareham, . . .	Survey and dredging,	14,295 89	1,000 00	15,295 89
Orleans,	Survey,	104 18	—	104 18
Pamet River, Truro, . . .	Survey, dredging and repairing jetties.	171,839 64	1,200 00	173,039 64
Paskamansett River, Dartmouth.	Dredging and jetty, . .	5,227 68	—	5,227 68
Penikese Island, Gosnold, . . .	Pile wharf and survey,	5,300 00	—	5,192 95
Plum Island River, Newbury and Newburyport.	Survey,	983 31	—	983 31
Plymouth Harbor,	Dredging,	174,782 09	71,794 55	220,074 37 ¹
Popponnessett Bay,	Dredging,	31,492 13	—	31,492 13
Powow River,	Dredging channel and riprapping wall.	502 94	—	502 94
Province Lands, Provincetown,	Reclamation,	83,000 00	—	80,891 28
Provincetown Harbor, . . .	Survey,	1,217 78	—	1,217 78
Quansett Harbor, Orleans, . . .	Survey,	195 88	—	194 50
Quicks Hole, Gosnold, . . .	Survey,	500 00	—	—
Red Brook Harbor, Bourne, . . .	Removing pier, . . .	275 00	—	275 00
Revere,	Stone breakwater, . .	60,407 09	—	60,397 93
Rock Harbor, Orleans, . . .	Dredging,	12,108 25	400 00	12,492 71
Rockport Harbor,	Dredging and removing rocks.	14,429 32	—	13,749 02
Salem Harbor,	Survey,	3,050 05	—	1,050 05
Salt Pond River, Eastham, . . .	Survey,	210 11	—	210 11
Salters Point, Dartmouth, . . .	Breakwater,	13,509 59	1,500 00	15,009 59
Sandwich Harbor,	Dredging channel, riprap and jetties.	80,579 84	—	80,579 84
Saugus River, Lynn and Saugus.	Survey and dredging,	19,206 64	2,000 00	20,845 17
Scituate,	Sea wall and riprap, . .	53,461 73	235 00	52,591 86
Scituate Harbor,	Dredging,	65,743 76	8,300 00	74,043 76
Scorton Harbor, Sandwich, . . .	Jetty and dredging, . .	19,426 39	500 00	17,774 34
Sesuit Harbor, Dennis, . . .	Jetty,	27,554 35	1,500 00	24,041 60

¹ \$57,000 expended under direction of United States government.

APPROPRIATIONS, ETC. — *Concluded.*

LOCALITY.	Character of Work.	Total Appropriation.	Contributions by Municipality or Others.	Total Expenditure.
Sippican Harbor, Marion, .	Survey, . . .	\$7 17	—	\$7 17
Smith's Cove, Gloucester, .	Survey and dredging, .	5,163 07	—	5,163 02
South River, Salem, .	Dredging, . . .	10,523 65	\$3,000 00	13,462 66
South Watuppa Pond, Fall River.	Fenders and excavation.	203 42	—	203 42
Stage Harbor, Chatham, .	Dikes and survey, .	10,803 01	—	10,803 01
Taunton River, . . .	Survey and investigation.	5,532 99	—	1,960 51
Taunton-Brockton waterway, .	Investigation, . . .	5,388 46	—	5,278 18
Taunton River-Boston Harbor Canal.	Survey, . . .	10,000 00	—	9,932 75
Taunton River-Massachusetts Bay Canal.	Survey, . . .	11,786 71	—	11,786 71
Vineyard Haven Harbor, .	Repairing sea wall, .	9,210 06	2,380 50	11,590 56
Vineyard Haven Harbor, Tisbury.	Breakwater and dredging.	45,089 48	1,000 00	45,518 25
Waquoit Bay, Falmouth, .	Breakwater wall and bulkhead.	20,488 98	2,000 00	22,190 59
Wareham River, . . .	Survey and dredging, .	37,349 27	5,000 00	42,349 27
Warrens Cove, Plymouth, .	Sea wall, . . .	14,468 97	9,713 98	24,481 22
Watch Hill, Chatham, . .	Survey and riprap, .	15,020 47	—	14,968 75
Wellfleet Harbor, . . .	Survey and dredging, .	16,867 22	1,500 00	17,600 29
West Bay, Barnstable, . .	Jetties and dredging, .	48,633 13	—	48,595 76
West Falmouth Harbor, Falmouth.	Dredging, . . .	25,655 31	—	24,386 18
West Harwich,	Survey,	9 00	—	9 00
Westfield River,	Survey,	5,000 00	—	4,740 39
Wild Harbor, Falmouth, . .	Jetty and dredging, .	15,671 59	5,000 00	15,614 72
Winthrop Shore,	Sea walls and protective work.	17,002 79	3,000 00	20,002 79
Witchmere Harbor, Harwich, .	Jetties and dredging, .	28,762 28	1,000 00	29,619 58
Woods Hole, Great Harbor, Falmouth.	Dredging,	5,468 86	1,500 00	6,968 86
Wrecks,	Removal from tide-water.	65,816 66	—	7,005 08
Yarmouthport Harbor, . . .	Survey,	83,977 37	7,000 00	90,977 37
		\$1,076,852 38	\$405,754 72	\$3,928,393 09

FEDERAL APPROPRIATIONS AND EXPENDITURES.

Federal appropriations and expenditures for improvement of rivers and harbors in Massachusetts from the establishment of the government to the close of the fiscal year ending June 30, 1919, as shown in the following tables, furnished by the Chief of Engineers, U. S. A.: —

TABLE NO. 1. — *Localities at Present under Improvement.*

[Compiled from the annual report of the Chief of Engineers, U. S. A., for the fiscal year ending June 30, 1919.]

LOCALITY.	Expenditures.	Appropriations.
Newburyport Harbor,	\$494,009 54	\$494,100 00
Merrimack River,	404,351 60	414,466 72 ¹
Sandy Bay, Cape Ann, harbor of refuge,	1,941,478 00	1,950,000 00
Gloucester Harbor,	538,183 00	542,083 00
Beverly Harbor,	49,125 00	110,625 00
Salem Harbor,	71,368 66	71,368 66 ²
Lynn Harbor,	471,000 77	476,837 00
Mystic River (upper portion), ³	304,854 70	336,050 00
Mystic River (below mouth of Island End River),		
Malden River,	71,202 68	149,950 00
Boston Harbor, ⁴	12,525,980 72	12,650,827 58
Dorchester Bay and Neponset River,	95,008 00	95,233 00
Weymouth Fore River,	275,356 47 ⁵	637,750 00 ⁵
Weymouth Back River,	26,500 00	27,000 00
Plymouth Harbor,	363,868 69 ⁵	391,959 80 ⁵
Provincetown Harbor,	348,062 72	362,162 97
Pollock Rip Shoals, Nantucket Sound,	399,891 72	600,000 00
Nantucket harbor of refuge,	574,797 95	586,473 50
New Bedford and Fairhaven harbors,	754,692 30	769,310 00
Taunton River,	201,837 17	210,189 18
Fall River Harbor,	380,911 49	380,911 49
Totals,	\$20,292,481 18	\$21,293,297 90

¹ Of original amount appropriated, \$900 was carried to the surplus fund of the treasury from previous project.

² Of original amount appropriated, \$1,131.34 was carried to the surplus fund of the treasury.

³ Now consolidated as one improvement.

⁴ Including Chelsea Creek.

⁵ Not including funds contributed by local interests.

TABLE NO. 2. — *Localities in which Work is not now in Progress.*

[Compiled from data furnished by the United States Treasury Department and the Chief of Engineers, U. S. A.]

LOCALITY.	Expenditures.	Appropriations.
Bass River,	\$20,150 34	\$20,150 41
Buzzards Bay Harbor,	2,500 00	2,500 00
Canapitset Channel,	5,312 54	9,800 00
Chatham Harbor,	12,171 36	13,732 79
Cohasset Harbor,	10,000 00	10,000 00
Duxbury Harbor,	37,000 00	37,000 00
East Dennis Breakwater,	7 57	1,500 00
Edgartown Harbor,	25,000 00	25,000 00
Essex River,	30,000 00	30,000 00
Hingham Harbor,	38,316 58	39,000 00
Hyannis Harbor,	221,787 75	221,267 07
Ipswich River,	5,617 91	7,500 00
Kingston Harbor,	8,940 09	10,000 00
Little Harbor, Woods Hole,	18,000 00	18,000 00
Manchester Harbor,	23,985 57	24,300 00
Marblehead Harbor,	833 42	1,900 00
Marthas Vineyard Harbor,	7,000 00	7,000 00
Powow River,	50,940 72	51,000 00
Rockport Harbor,	91,229 25	91,232 57
Scituate Harbor,	104,590 98	104,680 00
Town River,	37,577 41	37,577 41
Vineyard Haven Harbor,	55,387 35	60,000 00
Wareham Harbor,	95,997 30	96,236 00
Wellfleet Harbor,	11,365 57	16,000 00
Westport Harbor and River,	3,000 00	3,000 00
Winthrop Harbor,	9,000 00	9,000 00
Woods Hole Channel,	343,599 92	344,000 00
Totals,	\$1,269,311 63	\$1,291,376 25

RECAPITULATION.	Expenditures.	Appropriations.
Total of Table No. 1,	\$20,292,481 18	\$21,293,297 90
Total of Table No. 2,	1,269,311 63	1,291,376 25
Grand totals,	\$21,561,792 81	\$22,584,674 15

EXPENDITURES ON BOSTON HARBOR AND ITS TRIBUTARIES TO
JUNE 30, 1919.

[The tributaries given are those now under improvement, and do not include tributaries heretofore improved.]

LOCALITY.	Expenditures.	Appropriations.
Boston Harbor proper, ¹	\$12,525,980 72	\$12,650,827 58
Mystic River (below mouth of Island End River), ²	304,854 70	336,050 00
Mystic River (upper portion), ²		
Malden River,	71,202 68	149,950 00
Totals,	\$12,902,038 10	\$13,136,827 58

¹ Including Chelsea Creek.

² Now one improvement.

CONTRACTS AWARDED BY THE DIRECTORS OF THE PORT OF BOSTON

Contract No.	WORK.	Contractor.	Date.
25	Dry dock,	Holbrook, Cabot & Rollins Corporation.	June 22, 1914
51	Reclamation of flats at East Boston,	Atlantic, Gulf & Pacific Company.	Mar. 14, 1916

CONTRACTS MADE BY THE BOARD OF HARBOR AND LAND

Contract No.	WORK.	Contractor.	Date.
185	Ipswich River, Ipswich, concrete wall and timber bulkhead.	Rendle & Stoddard,	June 30, 1914
244	Nobscusset Harbor, Dennis, dredging channel and basin.	Maryland Dredging and Contracting Company.	Apr. 11, 1916

AND IN FORCE DURING THE YEAR ENDING NOV. 30, 1919.

Condition of Work.	Contract Prices.	Amount paid during Year ending Nov. 30, 1919.	Total paid to Nov. 30, 1919.	Estimated Amount of Contract.
Completed Jan. 21, 1920.	Unit prices,	\$664,757 35	\$1,871,737 92	\$1,979,055 94
In progress,	15.47 cents per cubic yard, . . .	223,292 22	965,629 90	1,338,322 95 ¹

¹ Includes extension of the original contract.

COMMISSIONERS AND PENDING DURING THE YEAR 1919.

Condition of Work.	Contract Prices.	Amount paid during Year ending Nov. 30, 1919.	Total paid to Nov. 30, 1919.	Estimated Amount of Contract.
Suspended,	Lump sum,	—	\$1,382 78	\$2,324 00
Suspended,	Dredging, 27.53 cents per cubic yard, measured in scows. Excavating bowlders, \$9.50 per cubic yard. Dredging and disposing of dredged material on land and flats, 27.53 cents per cubic yard, measured <i>in situ</i> .	—	72 31	9,300 00

CONTRACTS MADE BY THE COMMISSION ON WATERWAYS

Contract No.	Work.	Contractor.	Date.
9	Extension of contract No. 51 (Directors of the Port of Boston) for dredging and filling at East Boston.	Atlantic, Gulf & Pacific Company.	Oct. 6, 1916
15	Dry dock, pumping plant, . . .	Worthington Pump and Machinery Corporation.	July 30, 1917
15A	Dry dock, transformers, . . .	General Electric Company, . .	June 26, 1917
25	Chelsea Creek, dredging channel, .	Atlantic, Gulf & Pacific Company. (Assigned Mar. 19, 1918, to Bay State Dredging and Contracting Company.)	Aug. 9, 1917
26	Dry dock, sluice gates, . . .	Coffin Valve Company, . . .	Aug. 21, 1917
29	Ellisville Harbor, Plymouth, dredging channel and basin and rip-rapping banks.	Dennis F. Crowley, . . .	Aug. 21, 1917
31	Houghs Neck, Quincy, sea wall, .	Dennis F. Crowley, . . .	Sept. 18, 1917
36	Little Harbor, Marblehead, dredging basin.	George T. Rendle Company, .	Sept. 18, 1917
44	Dry dock, floors and stairs for pump well.	Donnelly Iron Works, Inc., .	Jan. 23, 1918
45	Dry dock, caisson,	Bethlehem Steel Bridge Corporation.	Apr. 23, 1918
47	Reserved Channel, bulkhead, .	William L. Miller Company, .	Apr. 15, 1918
49	Manchester Harbor, dredging, .	Bay State Dredging and Contracting Company.	May 1, 1918
50	Yarmouthport Harbor, Yarmouth and Barnstable, dredging channel.	Bay State Dredging and Contracting Company.	Oct. 7, 1918
51	Dry dock, crane,	Whiting Foundry Equipment Company.	July 1, 1918
54	Dry dock, pump house superstructure.	Weiss Construction Company, .	June 19, 1918
57	East Boston Pier,	William L. Miller Company, .	June 19, 1918
58	Falmouth Heights, sea wall, . .	William H. Connor, . . .	June 12, 1918
59	Harbor Cove, Gloucester, . . .	Thomas Fitzgibbon, . . .	June 3, 1918
61	Pamet River, Truro,	Bay State Dredging and Contracting Company.	Oct. 7, 1918
62	Connecticut River, Hadley, diversion wall.	Daniel O'Connell's Sons, . .	July 17, 1918

AND PUBLIC LANDS AND PENDING DURING THE YEAR 1919.

Condition of Work.	Contract Prices.	Amount paid during Year ending Nov. 30, 1919.	Total paid to Nov. 30, 1919.	Estimated Amount of Contract.
In progress,	15.47 cents per cubic yard, . . .	— ¹	— ¹	— ¹
Completed June 24, 1919.	Lump sum of \$192,979, . . .	\$27,162 90	\$173,807 10	\$193,119 00
Completed July 15, 1919.	Lump sum of \$14,942, . . .	892 50	12,964 20	14,942 00
Completed Aug. 11, 1919.	15.47 cents per cubic yard for material dredged and deposited on shores; 25.5 cents per cubic yard, measured in scows, for material dredged and placed in scows for transportation.	5,588 32	35,241 51	35,700 00
Completed Oct. 31, 1919.	Lump sum of \$21,500, . . .	1,152 00	19,350 00	21,500 00
Completed,	Dredging, 78 cents per cubic yard, measured <i>in situ</i> ; \$3.65 per ton for furnishing and placing stone.	—	7,673 37	12,645 00
In progress,	Unit prices,	5,440 00	5,440 00	14,576 50
Completed May 22, 1919.	Dredging, 49 cents per cubic yard, measured in scows. Excavating boulders, \$14 per cubic yard.	4,537 56	9,580 13	9,800 00
Completed Dec. 28, 1918.	Unit prices,	6,001 71	24,480 71	23,460 00
Completed Aug. 29, 1919.	Unit prices,	393,192 50	393,192 50	357,959 13
Completed Dec. 23, 1918.	\$34.19 per linear foot, completed bulkhead.	25,167 22	167,325 86	172,317 50
Completed May 3, 1919.	Dredging, 45.5 cents per cubic yard. Excavating boulders, \$15 per cubic yard.	21,541 18	26,133 84	22,750 00
Completed Oct. 31, 1919.	Dredging, 85 cents per cubic yard. Excavating boulders, \$15 per cubic yard.	88,080 95	88,080 95	70,550 00
Completed Mar. 6, 1919.	Lump sum of \$4,150, . . .	1,234 00	4,150 00	4,150 00
Completed Apr. 14, 1919.	Lump sum of \$34,554, . . .	27,272 80	34,664 00	34,664 00
Completed Mar. 6, 1919.	Unit prices,	113,039 53	306,120 60	294,000 00
Completed Dec. 10, 1918.	Concrete, \$11.65 per cubic yard. Throwing down standing sections, lump sum of \$1,142.65.	11,864 91	34,593 45	32,527 75
Completed Dec. 3, 1918.	Dredging, \$2 per cubic yard, .	2,440 40	3,412 80	2,600 00
Completed Nov. 29, 1919.	Dredging, 70 cents per cubic yard. Stone, \$5.60 per ton. Materials and dike, \$5,000.	169,075 96	169,075 96	152,840 00
Completed Dec. 21, 1918.	Furnishing and depositing stone, \$4.10 per ton.	4,108 61	10,426 91	8,200 00

¹ See Contract No. 51.

CONTRACTS MADE BY THE COMMISSION ON WATERWAYS AND

Contract No.	Work.	Contractor.	Date.
64	Trolley Freight Shed, South Boston, paving in front of roadway.	Coleman Brothers, . . .	July 25, 1918
66	Dry dock, capstans, . . .	The Wellman - Seaver - Morgan Company.	Nov. 1, 1918
67	Simpson's Patent Dry Dock, . .	Boston Dredging Company, .	Oct. 2, 1918
68	Dry dock, electric distribution systems.	Irving L. Matson, . . .	Mar. 6, 1919
69	East Boston Pier No. 1, heating and plumbing.	J. Caddigan Company, . .	Nov. 13, 1918
70	New Bedford State Pier, improvements.	J. W. Bishop & Co., . . .	Nov. 1, 1918
71	Nobscusset Point, Dennis, . .	Crosby & Taylor, . . .	Nov. 6, 1918
72	Falmouth Heights, protective work,	John A. Davis, . . .	Dec. 11, 1918
73	New Bedford State Pier, electrical equipment.	Ernest Howarth & Co., . .	Jan. 24, 1919
74	East Boston Pier No. 1, electric light and power systems.	Lord Electric Company, . .	Apr. 10, 1919
75	Dry Dock Avenue, South Boston, paving.	Coleman Brothers, . . .	May 12, 1919
76	Dry dock, South Boston, hand-power capstans.	Dake Engine Company, . .	Apr. 14, 1919
77	East Boston Pier No. 1, sprinkler and fire hose systems.	Globe Automatic Sprinkler Company.	May 19, 1919
78	Gloucester Harbor, dredging, . .	Boston Dredging Company, .	July 28, 1919
79	Bucks Creek, Chatham, dredging and jetty.	John R. Burke, . . .	May 21, 1919
80	Popponeset Bay and West Bay, dredging.	John R. Burke, . . .	June 16, 1919
81	Ellisville Harbor, Plymouth and Sandwich Harbor, Sandwich, dredging.	Boston Dredging Company, .	May 19, 1919
82	East Boston Pier No. 1, electric winches.	Lenher Engineering Company,	June 30, 1919
83	South Boston, viaduct, painting steel work.	Maurice M. Devine, . . .	July 30, 1919
84	Haywards Creek, railroad track, .	Old Colony Contracting Company, Inc.	July 21, 1919

PUBLIC LANDS AND PENDING DURING THE YEAR 1919 — *Continued.*

Condition of Work.	Contract Prices.	Amount paid during Year ending Nov. 30, 1919.	Total paid to Nov. 30, 1919.	Estimated Amount of Contract.
Completed Apr. 22, 1919.	Lump sum of \$7,500, . . .	\$29,389 35	\$57,163 10	\$61,924 00
Completed Oct. 8, 1919.	For each capstan complete with pit cover, \$13,050 per capstan. For rotary converter, \$8,615.	66,478 50	66,478 50	73,865 00
Completed Jan. 7, 1919.	Dredging, 45 cents per cubic yard,	2,356 65	2,356 65	2,356 65
Completed Oct. 4, 1919.	Lump sum of \$9,700, . . .	10,355 13	10,355 13	9,700 00
Completed Feb. 24, 1919.	Lump sum of \$5,047, . . .	4,532 21	5,047 00	5,047 00
Completed Feb. 6, 1919.	For shed, etc., \$45,487. For other work, unit prices.	63,328 42	63,328 42	64,062 60
Completed Mar. 25, 1919.	Furnishing and placing stone, \$3.85 per ton. Dredging, 50 cents per cubic yard.	4,679 48	4,679 48	4,579 50
Completed Jan. 16, 1919.	\$63.44 for each jetty complete in place.	1,843 68	1,843 68	1,843 68
Completed Mar. 4, 1919.	Lump sum of \$886, . . .	886 00	886 00	886 00
Completed June 6, 1919.	Lump sum of \$3,850, . . .	4,243 21	4,243 21	3,850 00
In progress, .	Unit prices, . . .	128,774 82	128,774 82	173,929 13
Completed July 6, 1919.	Lump sum of \$1,545, . . .	1,545 00	1,545 00	1,545 00
Completed Sept. 9, 1919.	Lump sum of \$11,191, . . .	11,391 00	11,391 00	11,191 00
In progress, .	Unit prices, . . .	35,768 49	35,768 49	38,000 00
Completed Aug. 9, 1919.	For dredging, 97 cents per cubic yard, measured <i>in situ</i> . Jetty, \$20 per linear foot.	15,790 00	15,790 00	11,850 00
In progress, .	For dredging, 63½ cents per cubic yard, measured <i>in situ</i> . For excavating bowlders, \$12.50 per cubic yard.	17,089 56	17,089 56	35,000 00
Completed June 19, 1919.	For use of dredge in Ellisville Harbor, \$550 per day. For use of dredge in Sandwich Harbor, \$500 per day.	10,525 00	10,525 00	8,500 00
Completed Nov. 5, 1919.	Lump sum of \$3,690, . . .	3,136 50	3,136 50	3,690 00
Completed Nov. 29, 1919.	Lump sum of \$3,985, . . .	3,842 85	3,842 85	3,985 00
This contract was assigned Sept. 10, 1919, to the Fore River Railroad Corporation.	Unit prices, . . .	-	-	40,153 75

CONTRACTS MADE BY THE COMMISSION ON WATERWAYS AND

Contract No.	Work.	Contractor.	Date.
85	Houghs Neck, dredging, . . .	Bay State Dredging and Contracting Company.	July 30, 1919
86	Lynn Harbor and Saugus River, dredging.	Bay State Dredging and Contracting Company.	July 28, 1919
87	Sesuit Harbor, Dennis, jetty, . . .	Crosby & Taylor,	June 30, 1919
88	East Boston, bulkhead,	W. S. Rendle,	Sept. 3, 1919
90	Commonwealth Pier No. 5, South Boston, coal for heating plant.	Metropolitan Coal Company, .	Sept. 3, 1919
91	Dry dock, South Boston, dredging approach.	Boston Dredging Company, .	Aug. 20, 1919
92	Bass River, Yarmouth, filling basin,	John R. Burke,	Aug. 4, 1919
93	Weir River, Boston Harbor, dredging.	Bay State Dredging and Contracting Company.	Sept. 15, 1919
94	Connecticut River, West Springfield, riprapping bank.	Daniel O'Connell's Sons, . .	Oct. 1, 1919
95	Orient Heights, East Boston, dredging.	Gerrish Dredging Company, .	Oct. 3, 1919
96	Waquoit Bay, Falmouth and Mashpee, repairing breakwater.	E. S. Belden & Sons, Incorporated.	Oct. 29, 1919
97	South Boston, industrial tracks south of Summer Street.	J. F. Kennedy & Co., . . .	Nov. 24, 1919
98	New Bedford State Pier, fire sprinklers.	General Fire Extinguisher Company.	Nov. 26, 1919
99	New Bedford State Pier, freight elevator.	F. S. Payne Company, . . .	Nov. 26, 1919

PUBLIC LANDS AND PENDING DURING THE YEAR 1919 — *Concluded.*

Condition of Work.	Contract Prices.	Amount paid during Year ending Nov. 30, 1919.	Total paid to Nov. 30, 1919.	Estimated Amount of Contract.
Completed Sept. 8, 1919.	For dredging, 57 cents per cubic yard, scow measurement.	\$13,236 54	\$13,236 54	\$15,390 00
In progress,	For dredging, 67 cents per cubic yard, scow measurement. For excavating boulders, \$20 per cubic yard.	53,257 93	53,257 93	30,150 00
Completed Oct. 21, 1919.	For furnishing and placing stone, \$3.85 per ton of 2,000 pounds. For excavating foundation, 85 cents per cubic yard, measured <i>in situ</i> .	2,909 84	2,909 84	2,395 00
In progress,	\$44.45 per linear foot of completed bulkhead.	48,586 00	48,586 00	71,120 00
Completed,	\$9.25 per gross ton, . . .	3,621 62	3,621 62	9,250 00
In progress,	For dredging, 65 cents per cubic yard, measured in scows.	111,197 25	111,197 25	130,000 00
Completed Aug. 18, 1919.	For use of dredge, \$350 per day, .	2,100 00	2,100 00	2,100 00
In progress,	For dredging, 53 cents per cubic yard, measured in scows.	33,846 97	33,846 97	106,700 00
Completed Nov. 21, 1919.	For furnishing and placing riprap, \$3.05 per ton. For replacing stone and broken concrete, \$1.45 per ton.	2,592 50	2,592 50	5,780 00
In progress,	For dredging, 33 cents per cubic yard, measured in place.	12,061 50	12,061 50	30,690 00
In progress,	For furnishing and placing stone, \$7.50 per ton.	1,731 39	1,731 39	4,500 00
In progress,	Unit prices,	-	-	9,275 25
In progress,	For furnishing and installing sprinklers and fire extinguishing apparatus, \$6,921. For furnishing and installing a pipe connection, \$417. For furnishing additional sprinklers, \$5.50 per sprinkler.	-	-	7,338 00
In progress,	Lump sum of \$4,796,	-	-	4,796 00

INDEX

INDEX.

COMMISSIONER'S REPORT.

	PAGE
Appropriations, Contributions and Expenditures for River and Harbor Work,	77
Bass River, Dennis and Yarmouth,	22
Boston Harbor,	7
Anchorage Basin,	16
Appropriations, Contributions and Expenditures for Improvement of	
Small Harbors and Channels within Boston Harbor,	75
Boston Harbor, Dredging,	65
Chelsea Creek,	16
Commercial Point, Dorchester Bay,	66
Commonwealth Flats at East Boston,	14, 66
Boston, Revere Beach & Lynn Railroad,	4
Commonwealth Pier No. 1,	15
Rail Connections,	4
Commonwealth Flats at South Boston,	7, 67
Commonwealth Pier No. 5,	7
Commonwealth Pier No. 6,	11
Dry Dock,	7, 66
Dry Dock Avenue,	10
Grain Elevator,	4
Railroad Yard,	12
Reserved Channel, Bulkhead,	12
Reserved Channel and Pleasure Bay, Dredging,	13
Trolley Freight Shed,	14, 69
Viaduct,	14
Commonwealth Flats, Development,	65
Commonwealth's Terminal on Weymouth Fore River and Hayward's	
Creek,	19, 66
Development of the Port of Boston Loan Fund,	65
Expenditures for Development and Improvement in Boston Harbor,	73
Financial Statement,	61
Further Improvement and Development of the Port of Boston,	3
Harbor Compensation Fund,	61
Harbor Line, Weymouth Fore River,	5
Hough's Neck, Quincy,	17, 70
Income of Harbor Compensation Fund,	61
Investigation as to Certain Rivers in Boston Harbor,	70
Investigation as to Feasibility of Bridge or Tunnel between Boston and	
East Boston,	70
Malden River,	5
Mystic River at Malden Bridge,	68
Mystic River, Improvement,	69
Orient Heights, Dredging,	17
Port of Boston Fund,	61
Port Development Appropriations,	69
Quincy Bay Shore,	70

Boston Harbor — <i>Concluded.</i>	PAGE
Simpson's Patent Dry Dock Company,	16
Weir River, Dredging,	18
Weymouth Fore River Harbor Line,	5
Buck's Creek, Chatham,	23
Cape Cod Canal,	41
Connecticut River,	24
Hadley,	24
South Hadley,	24
West Springfield,	24
Conservation of Water Resources,	6
Conserving and Equalizing the Flow of Water in Rivers and Streams,	38
Contracts made and pending during 1919,	84
Contributions and Expenditures for River and Harbor Work,	75
Ellisville Harbor, Plymouth,	25
Extension of Jurisdiction,	6
Fall River Harbor,	26
Falmouth Heights, Sea Walls,	26
Falmouth Inner Harbor,	27
Federal Appropriations and Expenditures,	37, 81
Financial Statement,	61
Fish Weir Permits approved during the Year,	51
Gloucester Harbor,	27
Five Pound Island,	27
Harbor Cove,	28
Great Ponds,	38
Licenses granted during the Year,	42
Little Harbor, Marblehead,	28
Lynn Harbor and Saugus River,	29
Manchester Harbor,	29
Massachusetts Atlas Sheets and Town Boundary Atlases,	40
Miscellaneous Permits granted during the Year,	47
New Bedford State Pier,	30
Nobscusset Harbor, Dennis,	32
Pamet River, Truro,	32
Popponeset Bay and West Bay,	33
Port Funds,	61
Province Lands,	6, 39
Receipts, 1919,	71
Recommendations,	3
Re-establishment of Certain Triangulation Points,	40
Rivers, Harbors, Tide Waters and Foreshores, exclusive of Boston Harbor,	21
Sandwich Harbor,	34
Sesuit Harbor, Dennis,	35
Waquoit Bay, Falmouth and Mashpee,	36
Waterways Fund,	71
West Bay, Barnstable,	33
Westfield River,	36
Yarmouthport Harbor,	36

